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■ Technological Disasters:

A Man-Made Tragedy

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Si nous ne voulons pas qu'un jour la terre ne soit plus qu'un champ de destruction et de désolation, il est grand temps de corriger certains de nos gestes, volontaires ou non.

C'est sur cette terre que nous avons grandi. C'est sur cette terre que, tout en devenant de plus en plus puissants, nous sommes devenus de plus en plus vulnérables. C'est sur cette terre que, tournant définitivement le dos à l'âge de la pierre, à travers nos découvertes successives, du feu à l'atome, nous sommes entrés dans une ère nouvelle, celle de la technologie.

Il ne s'agit pas d'un miracle, mais d'un phénomène tout simple : celui de l'évolution de l'homme. Complice de son héritage dans un monde, le nôtre, dont bien des éléments lui échappent tout en lui appartenant et dans lequel, tout en voulant construire et conquérir, malgré lui, il détruit.

Cette évolution s'accélère tandis qu'il découvre et compose de nouvelles cellules pour une vie meilleure. Tout va très vite. Un vertige s'empare de la terre et ce qui devrait ne faire que du bien fait hélas souvent beaucoup de mal. La terre ne tourne plus rond. Elle s'épuise et manque d'air, en temps de paix comme en temps de guerre.

En 1985, Haroun Tazieff, lors d'une conférence donnée au Palais des Nations à Genève, avait insisté sur la menace croissante des catastrophes technologiques et sur la vulnérabilité de notre société face à ce phénomène. Citant en exemple la catastrophe de Bhopal qui fit 200 000 victimes, il dit ceci : "nous sommes entrés dans une ère nouvelle, celle du risque technologique majeur." En effet, il y eut d'autres catastrophes, Mexico, Seveso, et surtout celle de Chernobyl qui restera gravée dans la mémoire de chacun.

La question qui se pose aujourd'hui alors que nous sommes sur le point de quitter le XX^{e} siècle et que nombre de conflits civils ravagent et déchirent la planète, n'est-elle pas de voir tous ensemble, s'il en est encore temps, comment nous pouvons non seulement retrouver la paix, mais donner à notre terre la possibilité de survivre et de respirer afin qu'elle demeure ce qu'elle a toujours été : notre seule et unique maison.

Genève, le 12 août 1993

The Legacy of a Man-Made Tragedy

by Jan Eliasson

In the early morning of Saturday 26 April 1986 two explosions blew the roof off Unit 4 of the Chernobyl nuclear power plant just north of Kiev, in the then Ukrainian SSR. The sequence of events which then followed was to represent the largest short-term release of radioactive materials into the atmosphere ever recorded. A situation of enormous and unprecedented complexity evolved. Health, social and environmental manifestations, both immediate and long-term, remain unclear and unpredictable.

I had a personal encounter with this tragedy seven years ago. At the time of the accident, I was serving in the Foreign Ministry of Sweden. We were the first to receive the warning signal, and I was one of those who had to take the responsibility for making sure that the outside world got to know about the accident. It was a very tense time - we were hoping that we were right, in view of the enormous responsibility for "tolling the distress bell", but deep down we were also hoping that we were wrong, and that a tragedy of this magnitude could not be happening.

The prevailing winds at the time were northwesterly and brought contaminated clouds over Sweden, where they later turned into rain clouds over Lapland province. The Laps - a nomadic minority - experienced heavy rainfall on the grazing lands of the reindeer. That land was doomed, the reindeer meat was contaminated and the Lap culture was dealt an almost fatal blow. This goes much deeper than most people realize and was a reminder to us about the effects, so much greater, close to the accident.

Emergencies today are occurring in the world almost on a daily basis. Some are natural disasters - earthquakes, cyclones, floods, etc. - and some, increasingly, are man-made. The United Nations is being asked to play a role to an extent that had never been the case before, involving itself in a growing list of ethnic and internal conflicts. Such wide-ranging involvement constitutes a serious challenge to the United Nations system.

CHERNOBYL

Une tragédie causée par l'homme

Dans la matinée du samedi 26 avril 1986, deux explosions ont littéralement soufflé le toit de l'unité 4 de la centrale nucléaire de Tchernobyl située juste au nord de Kiev, dans ce qui était alors la République socialiste soviétique d'Ukraine. Les événements qui ont suivi ces explosions devaient amener dans l'atmosphère une libération de matières radioactives de courte durée, mais la plus importante qu'on ait jamais enregistrée. Nous nous sommes alors trouvés face à une situation d'une complexité énorme et sans précédent dont les manifestations médicales, sociales et environnementales, tant immédiates qu'à long terme, demeurent vagues et imprévisibles.

J'ai été directement concerné par cette tragédie il y a sept ans. A l'époque de l'accident, j'occupais des fonctions au Ministère suédois des affaires étrangères. Nous avons été les premiers à recevoir le signal d'alarme et je comptais parmi ceux qui devaient s'assurer que le monde extérieur était mis au courant de l'accident. C'était une période d'extrême tension car, nous espérions que nous avions raison, vu l'énorme responsabilité qui nous revenait, de "tirer la sonnette d'alarme", mais, au fond de nous-mêmes, nous espérions aussi que nous avions tort et qu'une tragédie d'une telle ampleur ne pouvait se produire.

A l'époque, les vents dominants soufflaient en direction du nord-ouest emportant avec eux des nuages contaminés jusqu'au-dessus de la Suède où ils devaient ultérieurement se transformer en nuages de pluie tombant au-dessus de la province de Laponie. Les Lapons, qui sont une minorité nomade, ont vu de fortes chutes de pluie se déverser sur les terres à pâturage du renne. La région était ruinée, la viande de renne contaminée et la culture lapone recevait un coup presque fatal. Mais la situation était encore pire que la plupart des gens ne l'imaginait et nous rappelait les effets de l'accident, infiniment plus graves, à proximité de la centrale.

De nos jours, des catastrophes se produisent dans le monde presque quotidiennement. Certaines d'entre elles sont d'origine naturelle, les tremblements de terre, les cyclones, les inondations, etc., mais d'autres, et ce de plus en plus souvent, sont d'origine humaine. L'Organisation des Nations Unies se voit aujourd'hui demander de jouer un rôle d'une ampleur sans précédent, s'impliquant elle-même dans des conflits ethniques et internes dont la liste est de plus en plus longue. Une telle participation à grande échelle constitue un sérieux défi pour le système des Nations Unies.

A tremendous task for the international community is the technological and environmental disasters, the warning signals of which we have been receiving all too often lately - Tomsk, Chelyabinsk, to name but a few. These are ominous reminders of the importance of dealing with this issue also beyond Chernobyl. These problems, in combination with the dangers of civil strife and the uncertainty about the quality of maintenance at nuclear facilities, represent a concern for all of us.

But in this amalgam of emergencies, the problem of Chernobyl commands special attention in view of its unique and persistent character. The humanitarian, economic and social consequences of this accident continue to be felt by large numbers of the population in Belarus, the Russian Federation and the Ukraine. Therefore, in any realistic forecast of the challenges facing the United Nations, the issues surrounding Chernobyl are problems of a lasting character.

In May of this year, shortly after my appointment by the Secretary-General also as United Nations Co-ordinator of International Co-operation on Chernobyl, I undertook a mission to the affected States and to the exclusion zone around the power plant, in order to get a first-hand impression of the extent of the consequences of this accident. It was, I must say, a strong experience. Vast areas of land with burned-out red forests, burial grounds for contaminated trucks and helicopters, and the "ghost town" of Pripyat, where time seems to have stopped in April of 1986. But, most disturbing were the children, some with bulging necks, others with huge scars across their throats, all victims of thyroid cancer. There

La communauté internationale se trouve confrontée à une tâche colossale face aux catastrophes technologiques et environnementales dont nous avons reçu bien trop souvent, ces derniers temps, les signaux d'alarme, de Tomsk à Tchernobyl, pour ne citer que ces exemples. Ce sont là autant de sinistres rappels de l'importance qu'il y a à traiter aussi la question au-delà de Tchernobyl. Ces problèmes, conjugués au danger de troubles civils et à l'incertitude dans laquelle nous sommes au sujet de la qualité de l'entretien des centrales nucléaires, sont un sujet de préoccupations pour tous.

Mais dans cet amalgame de catastrophes, le problème de Tchernobyl exige une attention particulière en raison de son caractère unique et persistant. Les conséquences humaines, économiques et sociales de l'accident continuent d'être ressenties par de nombreux habitants du Bélarus, de la Fédération de Russie et de l'Ukraine. C'est ce qui explique que dans toute prévision réaliste des défis que les Nations Unies doivent relever, les questions touchant à Tchernobyl posent des problèmes durables.

Au mois de mai de cette année, peu après ma nomination par le Secrétaire général au poste de Coordonnateur des Nations Unies pour la coopération internationale en faveur de Tchernobyl, je me suis rendu en mission dans les pays touchés par la catastrophe ainsi que dans la zone d'exclusion entourant la centrale afin de me faire une idée personnelle de l'étendue des conséquences de l'accident. Ce fut, je dois le dire, une rude épreuve au cours de laquelle j'ai pu voir de vastes espaces de forêts entièrement brûlées, des cimetières de camions ou d'hélicoptères contaminés et la "ville fantôme" de Pripyat où le temps semble s'être arrêté en avril 1986. Mais le plus bouleversant c'était les enfants, certains le cou enflé, d'autres la gorge tailladée par de profondes cicatrices, tous victimes du

are numerous invisible consequences of the accident too, the catastrophic drop in the birth rate in Belarus, the national preoccupation with this problem in Ukraine and Belarus, which in themselves represent deep socio-psychological effects of the accident.

During this visit I had very open and wide-ranging discussions with Minister Voznyak of the Russian Federation, Minister Gotovchyts of Ukraine and Minister Kenik of Belarus, who are responsible for addressing the consequences of Chernobyl in their respective countries. One aspect of these meetings that I found very promising was the spirit of openness that all of them demonstrated, both with regard to Chernobyl proper, as well as to the larger problems of nuclear safety and nuclear waste management.

It is critical to continue this movement towards greater openness and transparency in these issues, which became possible as a result of the important social, economic and other changes that have taken place in these countries recently. Progress here could help set new standards and break new ground for the future. More importantly, we could finally become the masters of our own technology, which we certainly are not today.

In addressing the consequences of the Chernobyl disaster, "grand schemes" have not proved to be effective. The weak response of the international community to the Pledging Conference of 1991 was ample evidence of this.

There was a need for a new approach in order to effectively address this problem, and to make a tangible difference in the lives of those people who were still suffering at the hands of the Chernobyl disaster. This approach had to be based on solid facts and sober assessments. We have now determined the priorities and the most urgent needs, taken stock of ongoing programmes and put forward projects for future implementation, determined the time-frames for action, identified appropriate implementing entities and funding sources. Among the priority projects in the short-term are:

- research and treatment of incidences of thyroid cancer in children;
- establishment of nine psychological rehabilitation centres (for which funding has been secured in all cases);
- registration, diagnosis and treatment of the roughly 800,000 Chernobyl "clean-up"workers, to so-called "liquidators" living at present throughout the territory of the former Soviet Union;
- creation of an economic and social development area in the Russian Federation, with a view to implementing similar projects in Belarus and Ukraine, etc.

The new project-oriented approach forms the basis for a renewed effort to help mitigate the consequences of the disaster.

cancer de la thyroïde. Mais l'accident a aussi eu de nombreuses conséquences invisibles telles que la chute catastrophique du taux de natalité au Bélarus et l'inquiétude de l'ensemble de la population de l'Ukraine et du Bélarus face à ce problème, autant de profondes répercussions socio-psychologiques de l'accident.

Au cours de ma visite, j'ai pu avoir des entretiens très ouverts et approfondis avec le Ministre Voznyak de la Fédération de Russie, le Ministre Gotovchyts de l'Ukraine et le Ministre Kenit du Bélarus qui sont chargés de traiter les conséquences de Tchernobyl dans leurs pays respectifs. Ce que j'ai trouvé très prometteur lors de ces rencontres, c'est l'esprit d'ouverture dont tous mes interlocuteurs ont fait preuve tant en ce qui concerne Tchernobyl à proprement parler que les importants problèmes que soulèvent la sécurité nucléaire et la gestion des déchets radioactifs.

Il est essentiel de poursuivre dans la voie d'une plus grande ouverture et d'une plus grande transparence sur ces questions, ce qui a été rendu possible grâce aux importants changements socio-économiques et autres qui sont intervenus récemment dans ces pays. Tout progrès accompli dans ce domaine nous permettrait de fixer de nouvelles normes et, sur des bases nouvelles, de préparer le terrain pour l'avenir. Mais il y a plus important encore, puisque nous pourrions enfin devenir les maîtres de notre propre technologie, ce que nous ne sommes certainement pas aujourd'hui.

Dans le cadre de l'examen de la catastrophe de Tchernobyl, les "grands programmes" se sont révélés inefficaces, ainsi que le prouve amplement la réaction timide de la communauté internationale lors de la Conférence d'annonce de contributions de 1991.

Il fallait adopter une démarche nouvelle afin de traiter le problème de manière efficace et d'établir une différence tangible à l'égard de ceux qui continuent de souffrir de la catastrophe de Tchernobyl. Cette démarche devait se fonder sur des faits solides et sur de saines évaluations. Nous avons désormais défini l'ordre de priorité et les besoins les plus urgents, fait le bilan des programmes en cours et dégagé des projets pour le futur, fixé le calendrier des activités et identifié les organismes d'exécution et les sources de financement. Dans le court terme, les projets prioritaires touchent notamment aux domaines suivants :

- recherche et traitement des incidences du cancer de la thyroïde chez les enfants;
- création de neuf centres de réadaptation psychologique (activité pour laquelle le financement est assuré dans tous les cas);
- enregistrement, diagnostic et traitement des quelque 800 000 "préposés au nettoyage" de Tchernobyl, ceux que l'on appelle les "liquidateurs", à présent répartis sur l'ensemble du territoire de l'ancienne Union soviétique;
- création d'une zone de développement économique et social en Fédération de Russie pour mener des projets analogues par la suite au Bélarus et en Ukraine, etc.

Cette nouvelle démarche axée sur l'exécution de projets constitue le fondement d'un nouvel effort visant à contribuer à atténuer les

In this respect, closer co-operation and a more effective division of labour are essential, not only between the United Nations and the three affected States, but also among the United Nations system and the European Community, the Organization for Economic Co-operation and Development (OECD), the Conference on Security and Co-operation in Europe (CSCE), the European Bank for Reconstruction and Development (EBRD), the World Bank, bilateral donors, non-governmental organizations, industry, etc. The United Nations would act as a catalyst in this effort and assist in bringing the various parties together.

The general positive tone of the discussion of the Chernobyl item at the substantive session of ECOSOC in July and the endorsement of this new approach also by the European Community and Member States indicates that this strategy could provide the impetus for concrete and effective action on the Chernobyl issue, and that it may also serve as a model for addressing future technological disasters.

This approach can be fully effective and credible, however, only if the international community is prompted to lend a helping hand, not only out of solidarity, but also out of enlightened self-interest, stemming from an awareness of our common predicament.

Jan Eliasson
is Under-Secretary-General for Humanitarian Affairs and Co-ordinator of International Co-operation for Chernobyl.

conséquences de la catastrophe. A cet égard, il est indispensable de renforcer la coopération et de rendre la division du travail plus efficace, non seulement entre les Nations Unies et les trois pays touchés, mais aussi entre le système des Nations Unies et la Communauté européenne, l'Organisation de coopération et de développement (OCDE), la Conférence sur la sécurité et la coopération en Europe (CSCE), la Banque européenne pour la reconstruction et le développement (BERD), la Banque mondiale, les donateurs bilatéraux, les organisations non gouvernementales, les milieux industriels, etc. L'Organisation des Nations Unies agirait alors en tant que catalyseur et contribuerait à réunir les diverses parties concernées.

Le ton généralement positif des débats engagés sur la question de Tchernobyl à l'occasion de la session de fond du Conseil économique et social qui s'est tenue en juillet et l'adoption également dans la Communauté européenne et les Etats Membres de cette nouvelle démarche montrent qu'une telle stratégie serait de nature à favoriser une action à la fois concrète et efficace sur la question de Tchernobyl et pourrait par ailleurs servir de modèle à l'avenir en cas de nouvelle catastrophe technologique.

Toutefois, cette démarche ne saurait être valable et crédible que si la communauté internationale est disposée à tendre une main secourable, non seulement dans un souci de solidarité mais aussi dans son propre intérêt, consciente du fait que nous partageons tous le même sort.

Jan Eliasson
Secrétaire général adjoint aux affaires humanitaires et Coordonnateur des Nations Unies pour la coopération internationale en faveur de Tchernobyl.

The IAEA System For Dealing With Nuclear Accidents

by Bernard Weiss

Background

In the years following the establishment of the International Atomic Energy Agency (IAEA) in 1956 there was a dynamic growth in the worldwide use of radioactive material, not only from the nuclear power industry, but also through its use in industry and medicine. There was an increasing awareness that someday the Agency would have to play a role in dealing with accidents involving serious radiation exposures and releases. However, it was only subsequent to the Chernobyl accident in 1986, in which the Agency was called upon to mobilize a rapid response to an extensive radiological emergency, that a coherent and comprehensive plan was established to deal with emergencies at an international level.

The initial significant steps to treat the international aspects of emergencies followed the Three Mile Island accident in 1979. Two advisory documents were developed at the IAEA. The first, *Guidelines for Mutual Assistance Arrangements in Connection with A Nuclear Emergency*, was issued in the early eighties. This was followed by *Guidelines on Reportable Events, Integrated Planning and Information Exchange in a Transboundary Release of Radioactive Materials*. These advisory documents provided comprehensive guidelines for use in negotiating agreements between States prior to or subsequent to an accident. However, they provided a rather limited role for the IAEA.

Role of the IAEA

The Chernobyl accident in April 1986 with its transboundary aspects led to the rapid adoption in September of the same year of two conventions, one on *Assistance in the Case of a Nuclear Accident or Radiological Emergency* and another on *Early Notification of a Nuclear Accident*. These Conventions levy specific obligations and responsibilities on the States which are Parties to the Convention and define key roles for the IAEA. There are currently 65 parties to the Early Notification Convention, and 21 additional countries who are signatories but who have not yet ratified it. There are 63 parties and an additional 20 signatories to the Assistance Convention.

Four specific key roles are identified for the IAEA.

- To receive notification of an accident and, if requested, inform other States which may be affected.
- To receive and relay other information that may be useful to States or international organizations in minimizing radiological consequences.
- To respond to requests for support from a State and, where necessary, act as a *broker* between States.
- To offer its *Good Offices* to coordinate assistance to those States requesting support.

There are several accompanying tasks in support of these responsibilities. The Agency undertakes to:

- *screen incoming messages to authenticate and verify information.* It would be improper to provide countries with unofficial, inaccurate, or even obviously wrong data during an emergency.
- *compile and distribute periodic information and data summaries.* Most countries would have difficulties dealing with the voluminous material generated during a major radiological incident.
- *co-ordinate media and other inquiries at the request of States experiencing an emergency or for other international organizations.* Conflicting information from a multitude of sources is commonly associated with serious incidents. The IAEA can supply unbiased facts from one source on a continuous basis.
- *assist in controlling rumors.* With its extensive communications capabilities, the IAEA can contact sources to disavow false information quickly and provide factual details of an incident.

Emergency Response System (ERS)

With these specific roles and tasks as guidance, the Agency has developed an Emergency Response System (ERS) which in recent years has attained a full operational capability. However, there are countries that may not be able to notify the Agency through its ERS of a serious radiological incident on a timely basis, some having neither an adequate emergency response infrastructure nor communications capability.

The IAEA is committed to providing expert assistance to these countries to upgrade their response capabilities. As a result of an assistance project with Malaysia, the Agency has developed a model national emergency response plan, called RAD PLAN (Model National Emergency Response Plan for Radiological Accidents), particularly for those countries which have no nuclear power plants. This plan is available on a computer diskette, in Word Perfect 5.1 format. However, until all countries have implemented an effective plan, a truly worldwide Emergency Response System will not exist.

ERS Operation

To carry out its responsibilities in an effective and timely manner, the Agency has established an Emergency Response Unit in the Vienna International Center. A dedicated facility contains communication and computer equipment as well as the documents and data bases that would be needed during a radiological incident. One professional staff along with a full-time technical assistant and secretary maintain the facility. They also carry out related duties such as training for both staff and Member States personnel, exercising the Agency response capability, and data base development and maintenance.

To ensure readiness on a 24-hour basis, about 30 senior professionals serve as duty officers. These individuals are on-call at all times via telephonic pagers to receive emergency messages. They assess the significance of any emergency message and, if deemed necessary, contact senior Agency staff for further guidance.

Initial notification of an accident can arrive by telex, facsimile or other electronic means. During off-duty hours, the focal point is the Vienna International Centre Security Control Centre (VIC-SCC). The Security Officers are required to periodically scan messages received at the communications office during the night and contact duty officers if it contains information indicating the need for a rapid response.

If an event requires a response by the IAEA, there is a large number of staff who can be called upon to conduct the various required tasks. Specific detailed procedures for each task have been developed and several individuals have been trained to carry out each specific task. The Agency periodically conducts drills and exercises to reinforce the basic training of responsible staff.

Training is the key to an effective emergency response programme. At the IAEA, the Director General and senior managers participate in emergency response training and exercises along with the necessary professional and administrative staff.

ERS Documents

Any system whose proper functioning is dependent on numerous individuals and organizations, as is the Agency's ERS, must have available precise information and guidance on its operation. The Agency has prepared three documents on the overall programme including detailed procedures for use of the ERS. These documents are:

- ***Emergency Notification and Assistance Technical Operations Manual (ENATOM).***

The widely distributed manual describes the overall emergency response programme and the manner in which the Agency, States Parties, Member States and relevant International Organizations interface under the Conventions. It is designed to provide sufficient understanding of the international notification and information system to allow its incorporation into national emergency response plans. Additionally, data on human and technical resources available in Member States for use in a radiological or nuclear emergency are included.

- ***Handbook of Emergency Response Procedures***

The document contains the Agency operational procedures and describes the individual tasks to be performed by its staff during an emergency. It covers procedures for activation, notification, message authentication and verification, record-keeping and communications. It is continuously revised and updated with the latest full revision in November 1992.

- ***Guidance on International Exchange of Information and Data Following a Major Nuclear Accident or Radiological Emergency***

This guide was first published in May 1992. It explains the various systems for exchanging essential information and data during an emergency. It contains agreed-upon formats which should reduce omissions and errors in scientific units, and translation difficulties.

The Agency has recently notified Member States and international organizations of the availability of software programs to aid in the use of the suggested formats. The software has been developed in close co-operation with the Commission of the European Communities to provide some consistency between the programmes of both organizations. The software programs will (1) encode data and information into the prescribed format and (2) decode the formatted data, currently into English

only, but later into several other languages.

Exercise of the ERS

In order to demonstrate the Agency's response capability, periodic comprehensive exercises involving participation by a number of Member States and international organizations are carried out. Its purpose is not only to fully test the system but also to provide training to ERS member countries and to determine where improvements are required. Because of the importance of the media in any emergency, exercise scenarios contain public information situations that may arise. Calming public concerns and anxieties, responding to media inquiries, determining the validity of rumors, and conducting press briefings are obviously important aspects of responding to emergencies.

Two exercises of the Agency's ERS have been conducted, one in April 1990 and the second in January 1992. The exercises involved about 50 IAEA staff in addition to those from Member States, other UN organizations, and the various Missions to the IAEA which receive exercise messages and participate as appropriate. Following the exercises a detailed list of lessons learned was developed. This has resulted in improvements in the ERS organization, in its resources and facilities, in operational procedures and in its communications capabilities.

Recent Experience

The international response to the Three Mile Island accident and the IAEA's direct involvement with the Chernobyl accident will continue to shape the Agency's emergency response programme. However, the more frequent limited and confined incidents will call for IAEA involvement.

Just recently, in March 1993, The Agency received a request from Vietnam for medical advice and possible assistance to deal with an overexposure of an individual conducting research using a 15 Mev electron beam. In fact, Vietnam became the first country to specifically invoke the Assistance Convention in calling for the medical advice. The IAEA took immediate action. They sent an expert team to Vietnam to obtain details of the incident and provided radiation protection and medical expert assistance. The IAEA then arranged for the patient to receive specialized treatment at the French International Center of Radio-pathology.

In 1987, a serious radiological emergency involving a large caesium-137 teletherapy source occurred in Brazil. The source from a unit which was left in a partially destroyed state at a site being demolished was removed by two men. It was eventually sold and broken apart. There were eventually 4 deaths from overexposure along with 200 significant exposures and there was extensive contamination in the city of Goiana. Large media attention and widespread public concern followed. Soon after becoming aware of the accident, the Brazilian authorities, although not invoking the Assistance Convention, informed the IAEA. The Agency provided assistance in the form of equipment and expert services. Subsequently, a detailed report documenting the cause and consequences of the accident was published by the IAEA.

Another serious radiological incident occurred in 1989 involving overexposure from cobalt-60 of three workers in an industrial irradiation facility for medical products in El Salvador. Two of the workers, one of whom eventually died, had leg amputations and the third, although suffering from some overexposure related consequences, is back at work. The Agency provided dosimetry and medical support to the team providing specialized treatment to the workers in Mexico City. The Agency continued to provide medical advice to the patients' physicians upon their return to El Salvador. A detailed report documenting the cause and consequence of the accident was published by the IAEA.

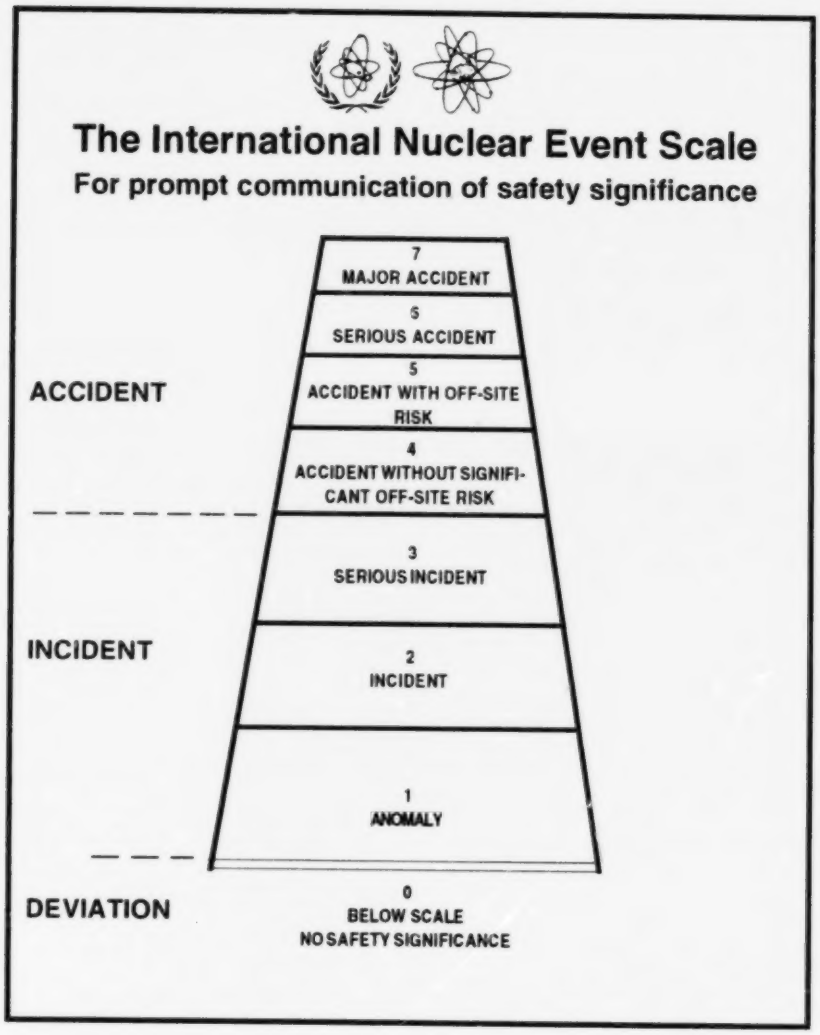
The Agency has also been able to quickly obtain facts in a number of events which enabled it to negate concern caused by inaccurate and false information. These included situations involving the exaggerated radiological concerns about the accident at the Vandelos facility in Spain in 1989 and the beryllium fire at the Ust Kamenogorsk site in the USSR in 1990.

The best example of calming unfounded fears involved an incident at Unit 3 of the Sosnovyi Bor Nuclear Power Plant near St. Petersburg, Russia, in 1992. The accident aroused considerable concern at the Governmental level as well as in the general public. The Agency received early information from Russian authorities who classified the event as a level 3 on the International Nuclear Event Scale (INES), a level designated as a serious incident with no radiological consequences. By utilizing the Emerg-ency Response System facilities, incident details were obtained, assessed and provided to officials in Member States and international organizations. The Agency issued a press release indicating that the event would likely be assigned level 2 on the INES scale, a level designated as an incident having limited safety significance. The event was eventually classified as level 2 by USSR authorities.

International Nuclear Event Scale

The International Nuclear Event Scale (INES), although not a part of the Agency's Emergency Response System, is an important communication tool now being used by the Agency and its Member States to categorize radiological events. It creates a common understanding of nuclear events for the media and the public.

Events are classified only if they are of nuclear or radiological safety significance. Events of purely industrial safety significance are not classified but are termed 'outside of the scale'. The scale ranges from level zero, for a below scale



deviation having no safety significance, to level seven, for a major accident with widespread health and environmental consequences. On the INES scale, the Chernobyl accident would be rated a level seven major accident. The Three Mile Island accident would be rated a level five accident with off-site risk as there was serious damage to the reactor core and a potential for off-site radioactive releases. Events of level 3 or below are termed incidents. A representation of the scale is shown in the above Figure.

This system is not to be confused with the emergency classification system that is used by nuclear power plant facilities. Most facilities use the IAEA recommended four level system (Standby, Plant Emergency, On-site Emergency, and Off-site Emergency). Its purpose is for informing on-site staff and off-site authorities of the immediate automatic actions which are to be taken to protect the health and safety of the public. There is no conflict between the two systems; one is used to communicate actions that are to be taken by emergency responders and the other is a tool for communicating with the media and general public.

Although most INES reported events are level one or off-scale, they often draw intensive media coverage. INES is proving useful in effectively communicating the nature of events that are often described in specialized technical terminology. As mentioned previously, the incident at the St. Petersburg nuclear power plant in March 1992 is an example of its effectiveness. As the incident occurred at a Chernobyl-type reactor, media interest was high. The Russian authorities used this scale in their prompt reporting of the incident and there was then a more easily understood point of reference to judge the severity of the event.

Since its creation, INES has been used predominantly to describe events at nuclear power plants. Recently it was adapted to include potentially all civil nuclear installations and transport incidents involving radioactive materials.

In concert with the Emergency Response Unit and the INES information system, the Agency's Public Information staff has been able to provide timely and accurate information concerning minor operational events at nuclear facilities which were being inaccurately described by the media.

Summary

The IAEA has taken practical steps to fulfill its responsibilities under the two existing international Conventions. It has provided dedicated space, manpower, and resources towards developing a comprehensive Emergency Response System. That system has been implemented by procedure development, team building, and training and has reached a stage of full capability. In order to demonstrate that capability and upgrade the programme, the Agency has conducted comprehensive exercises involving Member States and international organizations which have led to overall improvements in the Agency's response capability. ■

Bernard H. Weiss is Co-ordinator, Emergency Assistance Services, Division of Nuclear Safety, International Atomic Energy Agency, Vienna, Austria.

Technological Disasters: The Role of WHO

Coping with Disaster: Atomic Tests

UN/YGMA Photo

WHO is mandated by its Constitution and several World Health Assembly resolutions to provide health assistance in emergencies, including technological emergencies. Before, during and after such disasters, WHO helps countries strengthen their capacity to deal with the public health aspects of technological disasters.

WHO's wide-ranging activities related to technological disasters include: providing epidemiological advice on what kinds of deaths and injuries to expect from certain chemical, radiological and nuclear hazards; providing guidance on counter-disaster planning for technological disasters; preparing public health standards and guidelines; furnishing technical assistance on health issues; shipping drugs and supplies; conducting rapid health assessments, etc. WHO works, of course, in contact with the Department of Humanitarian Affairs and other UN agencies on these issues.

WHO's emergency operations for technological disasters, natural disasters and complex emergencies is co-ordinated by its Division for Emergency and Humanitarian Action. The Division draws upon the resources of WHO's worldwide health network, which includes over 25 technical divisions, six regional offices and scores of "collaborating centres" in countries all over the world. For issues related to technological disasters, the Division of Environmental Health and the Programme for Chemical Safety conduct several activities that specifically address health aspects of radiological and nuclear disasters (such as Chernobyl), chemical spills and leakages, and pesticide residues. The articles that follow highlight some of WHO's activities related to technological disasters. ■

(This section was co-ordinated and edited by WHO's Division of Emergency and Humanitarian Action/Emergency Preparedness and Planning Programme.)

Chernobyl Seven Years Later

WHO Spearheads International Programme

Before 26 April 1986, the word "Chernobyl" was recognizable only to a handful of nuclear energy experts as the location of a nuclear power station. Seven years after a nuclear reactor in the small town of Chernobyl in the Ukraine exploded and burned, the long-term implications from one of the world's worst nuclear disasters are still being examined.

The Chernobyl explosion released huge amounts of radioactive materials into the atmosphere. Two days after the accident occurred, WHO established an emergency project. Through its Regional Office for Europe, WHO collected and distributed data concerning public health in Europe and gave ad hoc advice until the acute phase was over. Based on this experience, WHO provided guidance materials on public health actions in the case of radioactive contamination (iodine prophylaxis, psychological care, public information and intervention levels for food).

The magnitude of Chernobyl's impact, however, called out for a long-term international programme to assist the affected populations, as well as increase scientific knowledge regarding health effects of radioactivity. Two years ago, WHO established the International Programme on the Health Effects of the Chernobyl Accident (IPHECA). Today, IPHECA is operational in all three states - Belarus, the Russian Federation and the Ukraine - that took the brunt of the Chernobyl fall-out. About 300,000 people live in highly contaminated areas, which puts a constant burden on the local communities and leads to a deterioration of the general public health status.

IPHECA is intended to remain operational for many more years to come. Its main purpose is to assist people in the three affected countries by providing expertise, equipment, training and information. The Programme aims to make a unique contribution to the fields of radiation epidemiology and disaster preparedness.

At the present time, specialists in the three countries are medically examining tens of thousands of people annually under the Programme. It started with five pilot projects:

- The **Haematology project** aims at identifying and treating leukaemias and other related blood disorders in the population of approximately 270,000 in the most contaminated zones of the three countries.
- The **Thyroid project** is designed to strengthen local capabilities for the early detection and treatment of thyroid disorders. Intensive studies in Belarus

After Chernobyl — Igor Costin, USSR

Health for all - All for Health - International Photo Competition

are underway following local reports of serious thyroid diseases. Eventually, the project will be monitoring health conditions of some 75,000 children in all three countries.

- The **Brain damage in utero project** identifies cases of mental retardation and other possible brain dysfunctions caused by exposure to radiation in utero (ie, in the womb). It will also be looking into possible psychiatric and psychoneurological effects as a result of this exposure. The project will be examining all children born within one year after the accident in the affected areas.

- The **Epidemiological Registry project** based on the national registries is well underway in all three affected countries. This project aims at gathering complete and reliable statistical, health and socio-economic data essential for the correct assessment of the state of health of the affected populations. It will provide valuable information for future research on the long-term effects of radiation.

- The **Oral Health project** was initiated at the request of Belarus. Poor oral health appears to be one of the most common complaints received by the medical teams in the contaminated areas. Some 5,000 persons residing in the most contaminated zones will be participating in the project. Samples of tooth enamel collected in the course of the project will be measured for radiation doses.

IPHECA co-ordinates its work with Chernobyl programmes of other international and national organizations such as the IAEA, UNESCO, IARC, Red Cross, Council of Europe, CEC, Sasakawa Foundation, Radiation Effects Research Foundation, International Consortium for Research and Treatment of Radiation-Induced Injuries, National Organizations of the Czech Republic, Finland and the USA and others.

The pilot phase of IPHECA will come to an end in the middle of 1994. By that time, the Programme will have greatly helped improve diagnostic and therapeutic capabilities of the three countries. International support, however, will continue to be necessary to supply medical materials, maintain imported equipment, and exchange information with the world scientific community.

The knowledge and experience gained from the unfolding of the Chernobyl aftermath is of much more than local interest. Indeed, the entire international community stands to gain from the continuation of this programme. ■

After Chernobyl — Igor Costin, USSR

Health for all - All for Health - International Photo Competition

Prepared by Natalie Domeisen, WHO's Division of Emergency and Humanitarian Action/Emergency Preparedness and Planning Programme with contributions from the WHO Office of Information and Dr. I. Riabenkhine, WHO/Division of Environmental Health.

Pesticide Residues: When is a Little Too Much?

WHO/Documenta Photo

Chemicals serve mankind. But national and international collaboration is needed to minimize potential health risks to humans, animals and the ecology.

Acute pesticide poisoning (i.e. poisoning due to weedkillers, pesticides, etc.) affects an estimated 3 million people per year, mostly in the developing countries. About 220,000 of these die as a result of the intoxication. As a result of long-term effects caused by chronic exposures to pesticides, another 750,000 to 800,000 suffer from lasting damage to health each year, including increased risk to various forms of cancer.

In the late 1950s, scientists became concerned about pesticide residues left on or in food as a result of normal agricultural practices. WHO and FAO realized that the health hazard posed by pesticides could possibly lead to "creeping" or chronic technological disasters. The potential for harm world-wide was sufficiently grave for WHO and FAO to work together to control the severe hazards posed by pesticides.

Since 1961, WHO and FAO have been meeting regularly at the Joint WHO/FAO Meeting on Pesticide Residues (JMPR) to review toxicological evidence of the effects of pesticides. The group makes recommendations on standards and acceptable levels of these pesticides.

Whether pesticide poisoning occurs depends on the dose to which people are exposed. That is why one of JMPR's major achievements has been to establish standards for acceptable daily intake (ADI) of pesticide residues. ADI guidelines are based on:

- the chemical nature of the residue;
- the toxicity of the chemical (based on data from acute, short-term and long-term studies and whatever is known of its metabolism in the mammalian host);
- knowledge of the effects of the chemical on humans (based on epidemiological data or occupational health studies).

Based on ADI-related standards, countries have the responsibility to introduce a regulatory framework that protects workers as well as the public at large from unacceptable levels of exposure. JMPR has been a major force in helping countries to set these guidelines. It also produces publications which provide valuable guidance on how to improve testing and standard-setting procedures.

WHO also works with FAO to ensure implementation of the International Code of Conduct on the Distribution and Use of Pesticides and the international agreements on Prior Informed Consent, covering trade in banned or severely restricted pesticides.

For further information, contact: Director, International Programme on Chemical Safety, WHO, Geneva. ■

Prepared by R. Slooff, WHO/Division of Environmental Health and N.Domeisen, WHO/Division of Emergency and Humanitarian Action/Emergency Preparedness and Planning Programme.

Radiological and Nuclear Disasters: Health Implications

Radiological disasters occur when people are exposed to ionizing radiation. For example, improper disposal of radioactive waste in the environment or improper handling of radioactive sources may lead to radiological disasters. A nuclear disaster occurs when a nuclear installation is deliberately exploded (a nuclear bomb) or goes out of control (a nuclear reactor).

The impact on health of radiological and nuclear disasters may be due to external exposure, internal exposure or to both. Gamma-rays or neutrons from an external source can irradiate the whole body and beta-particles can damage the skin, even through clothes. Internal exposure is caused by ingested or inhaled radionuclides.

The health effects of radiation exposure are either caused by the destruction of cells (deterministic effects) or by the transformation of cells (stochastic effects). The deterministic effects can be exemplified by radiation sickness (acute or chronic), radiation burns of the skin and the eye, thyroiditis caused by uptake of radioiodine in the thyroid, etc. The stochastic effects include induction of cancer and genetic disorders.

WHO's Radiation Emergency Medical Preparedness (REMPAN)

To promote radiation emergency medical preparedness and provide practical assistance to countries in case of overexposure, WHO has established a network of eight collaborating centres in Paris, France; Oak Ridge, USA; St. Petersburg, Russia; Melbourne, Australia; Buenos Aires, Argentina; Rio de Janeiro, Brazil; Ulm, Germany and Hiroshima, Japan. These collaborating centres, which have already rendered international help in radiation emergencies, provide advice and training; help develop medical emergency plans; and assist in preparing relevant documents and meetings. Should a radiation accident occur, the centres can provide teams for on-site emergency treatment and radiation monitoring; transportation of patients; and facilities or staff for medical investigation and treatment.

Global Environmental Radiation Monitoring Network (GERMON)

WHO and UNEP have joined forces to create a Global Environmental Radiation Monitoring Network (GERMON). The network gives information on environmental radiation levels for about 20 countries. Another 30 countries have provided contact points. In the case of a major radioactive release, the network steps up its radiation measurements to supply national authorities with data on ambient external radiation, and on concentrations of radionuclides in the air, precipitation, milk and other substances. In doing so, GERMON supports the Convention on Early Notification in the Case of a Nuclear Accident.

The network is based on the national liaison institutions that gather and process data from national monitoring stations or laboratories in their countries. Overall co-ordination, compilation and analysis of the data takes place at the Central Service for Protection against Ionizing Radiation, Le Vésinet, France. The Centre then provides radiation assessments to WHO, UNEP, the IAEA and national liaison institutions of the network. ■

Prepared by Dr. I. Riabokhine, WHO Division of Environmental Health and N. Domeisen, WHO Division of Emergency & Humanitarian Action/Emergency Preparedness and Planning.

WHO's "How-to" Guide to Rapid Health Assessment

Looking for a "how-to" guide to assess the health impact of chemical emergencies? In 1990, WHO produced a draft series of nine Rapid Assessment Protocols for use in various types of emergency situations.

One of the nine booklets, Rapid Health Assessment in Chemical Emergencies, outlines the steps needed to conduct a rapid assessment in case of chemical accidents. The booklet provides checklists for action in the preparedness phase, guidelines for contingency plans, and step-by-step instructions for conducting rapid assessments after a chemical accident occurs.

For more information contact: WHO Division of Emergency and Humanitarian Action, Emergency Preparedness and Planning Programme, Geneva, Switzerland.

Chernobyl: Food Contamination and the FAO Response

In April 1986 the nuclear reactor at Chernobyl, in the former USSR, malfunctioned releasing abnormal amounts of radioactive materials (radionuclides) into the atmosphere. The event captured world wide attention and provided the media with seemingly never ending headlines.

In some parts of the world, remote from the accident, fear of radioactive contamination was as great as that of those close to Chernobyl. Many, in fact, were terrified at the prospect of lingering death from radiation sickness, and deformity of plants and animals from genetic mutation loomed as something very real. Never before in peace time had such an event taken place. People had died and others were dying. The media highlighted the possible long term effects on health and heightened anxiety by publicizing the prospects for the extended contamination of the environment from radionuclide fall-out.

In reality, relatively large amounts of radionuclides had been released into the atmosphere and were carried by prevailing weather for thousands of kilometres through Europe, Asia and around the northern hemisphere. Each day concerned residents in Europe looked skywards assessing the speed of clouds and their direction. The prospect of rain and the contaminants it would carry was of continuing concern. Parents didn't know whether to let children play outside, and farmers were unsure whether they should plough under green leafy crops that had been exposed to fallout. Nobody knew for sure whether milk, meat and vegetables originating from fallout affected areas were safe to eat or whether exposed food should or should not be destroyed.

At Novozybkov, 120 km northwest of Chernobyl, authorities instructed the kindergarten to wash the rooms with water, keep children indoors and not to open windows. They recommended that all babies not being breast fed be given food prepared from imported powdered milk to avoid contamination. A kitchen which provided milk to babies under one year old when mother's milk was unavailable to them, was closed. Later it was re-opened using milk powder from elsewhere. Food control authorities acted immediately after the accident and were principally concerned with milk and meat. Distribution of local milk was discontinued and supplies from a clean area 100 kilometers or so away were brought in. Locally grown fruits and vegetables were placed under continual check for contamination. In addition, wild game, fish, mushrooms and wild berries could be taken for testing to a laboratory established for the purpose. Despite assurances from authorities that exposure to Chernobyl-generated fallout would only marginally increase the normal background radiation experienced by the population before the accident, consumers were not reassured. Their fear of the invisible hazard was manifest and unshakeable.

The anxiety of the population had widespread nutritional repercussions. The diet of people in areas adjoining Chernobyl changed markedly and there was overwhelming evidence that consumers no longer trusted their food supply. Beginning in May 1986, there was a significant decrease in the consumption of meat and vegetables resulting in a 25 per cent drop in protein intake and a 30 per cent reduction in carbohydrate intake. Consumption of fresh fruit fell by 84 per cent. Not surprisingly, symptoms associated with vitamin B series and vitamin C deficiencies were reported, such as the incidence of rickets in one to three year old children. This may have risen from an insignificant figure to 10-20 per cent as a result of sunlight deprivation caused by children being confined indoors and a dramatically reduced milk supply. The low intake of nutrients reflected a lack of confidence by consumers in the food they were accustomed to eating.

Much of the anxiety generated by the Chernobyl accident emanated from the lack of public knowledge and access to comprehensive international guidance on radionuclide contamination. As a result, authorities responsible for agriculture, environment, health and trade were unable to take uniform action to control radionuclide contaminated food and feed. Not only were individual

consumers confused about what was safe and what was unsafe to eat, individual countries, too, had different views about what were and were not acceptable levels of radionuclide contamination of foods. This led to confusion amongst national food control authorities and the disruption of international trade and commerce.

At one time or another prohibitions by importing countries were placed on food exports from countries believed to have been exposed to Chernobyl generated radionuclides. Countries of Europe quarantined each others foods. Countries of the Middle East and elsewhere introduced requirements that food exports from suspect countries be accompanied by official government certificates attesting that the products to which they applied complied with specified levels of radioactivity. Even countries half a world away from the accident, including Australia and New Zealand, were required by some countries to provide such certification. It is something of an enigma that most countries directly affected by radioactive fallout from Chernobyl took significantly different, and usually less restrictive, approaches to control the level of radio-nuclide contamination in food than those countries not directly affected.

Following the widespread anxiety and confusion that existed after the accident, relevant international organizations including the Food and Agriculture Organization (FAO), the World Health Organization (WHO) and the International Atomic Energy Agency (IAEA) acted to provide or improve on the guidance available to member countries on appropriate responses to nuclear accidents.

To facilitate prompt informed guidance to the international community on acceptable levels of radioactive contaminants in foods, FAO convened an Expert Consultation on Recommended Limits for Radionuclide Contamination of Foods. The Consultation included food control, radiation protection and safety experts from a number of countries.

In January 1987, and pending final recommendations of FAO, WHO and IAEA, the recommendations of the Expert Consultation were transmitted by the Director-General of FAO to all FAO member countries, all UN agencies and to all other known interested parties as interim guidance on how to evaluate the radioactive status of food moving in international trade.

During March 1987, the interim FAO recommendations were further considered and endorsed by the Codex Committee on Food Additives and Contaminants (CCFAC) - a subsidiary body of the Codex Alimentarius Commission (CAC) - the foremost international food standards body (144 member countries) charged with protecting the health of consumers and ensuring fair practices in the food trade. The secretariat is located

UN/SYGMA Photo

in FAO Headquarters, Rome. The CAC commended the FAO Expert Consultation for its prompt response in providing the only available international recommendations for radionuclide contamination in foods.

The FAO Expert Consultation utilized food control principles to uniformly allocate the total amount of radioactivity from a dose of 5 millisieverts (5mSv) over 100% of the food consumed. The FAO Expert Group assumed that all foods would be contaminated and utilized the most sensitive population group and body tissue in making its recommendations. On this basis, the group recommended interim international radioactivity action levels in foods which were considerably lower than those recommended by other groups. The FAO interim values were not significantly different from some national levels and those adopted by the Commission of European Communities (CEC) soon after the Chernobyl accident.

In assessments of acceptable contamination levels made by WHO, IAEA, OECD and the European Community Article 31 group in 1986-1987, approaches tended to concentrate on radiation protection and safety principles rather than food control and food law procedures. The dose level of 5 mSv was accepted by most groups as a basis for calculation. However, differences of assumptions about the percentage of food supply that might be contaminated and about which dose conversion factor should be used usually resulted in higher acceptable contamination levels than the FAO interim levels.

During late 1986 and 1987 WHO engaged several consultants and held a preliminary meeting in April 1987 to prepare the WHO recommended health-related approach to radionuclide contamination in foods. In September 1987, WHO held an expert consultation in Geneva and also invited participation of FAO, OECD, IAEA, ICRP and the Commission of the European Communities (CEC). The WHO Expert Consultation provided methodology and guideline values which could be used by national authorities as a basis for setting their own levels. Five mSv was accepted as the reference level of dose and food consumption was normalized to a hypothetical intake of 550 kg per annum. The potentially contaminating radionuclides were divided into two main classes, the actinides such as Plutonium 239 and all others such as Caesium 137. Only food groups that were consumed in quantities greater than 20 kg/per annum were used in the calculation of the guideline values, and special values for infants were developed. Additivity of radionuclides contaminating one or more food groups was accommodated. These values, while assisting member states to develop their own levels, were considered too complex and unsuitable for application to international trade in food.

The principles applied to the control of contamination of foods moving in international trade are similar to those used in national food control legislation. These have been successfully applied by the Codex Alimentarius Commission in making recommendations about environmental contaminants such as lead, cadmium and mercury in food, and were the basis for establishing guideline levels for aflatoxins. These food protection principles are based on the utilization of safety factors which assure the consumer of wide margins of safety beyond the basic levels derived from known health and toxicology research data. At the same time they provide national food control authorities with simple and uniform levels which can be applied to all foods moving in trade, whatever their origin, and whatever their destination in the distribution chain after clearance by control officials.

In most countries, national food law prohibits sale or shipment of food contaminated with poisonous or deleterious substances. However, it is recognized that certain low levels of contaminants are unavoidably present in food and maximum levels for their occurrence have to be set to protect the safety of food supplies to all consumers. In arriving at a contaminant level, toxicological data on test animals are reviewed, and a series of conservative assumptions and safety factors are applied in setting the contamination level to be used for regulatory food control purposes. If a no-effect level has been demonstrated in controlled animal feeding tests, that level is the departure point for applying conservative assumptions and safety factors to arrive at much lower contamination levels for foods for human consumption. For contaminants such as radionuclides or mycotoxins, where it is assumed that effects occur below experimentally determined levels, additional considerations are applied in setting contaminant levels which acknowledge the impossibility of avoiding all inadvertent contamination of foods with these substances.

On examination, the approaches taken by WHO and FAO, and indeed of other organizations, in deriving values were basically similar. They all assumed a reference level of dose (usually 5 mSv), a total average food consumption rate, a dose per unit intake factor for various radionuclides and a pattern of food consumption, and calculated levels by the following formula:

$$Level = \frac{RLD}{m \times d}$$

Where

RLD = Reference Level of Dose (Sv)
M = mass of food consumed (kg)
d = dose per unit intake factor (Sv/Bq)

Controlling radionuclide contamination of foods moving in international trade requires simple, uniform and easily applied values. On that basis, it is clear that for regulatory purposes a simpler approach based on the measurement of total gamma activity is appropriate. This approach is one that can be uniformly applied by government authorities and yet one that achieves a level of public health protection to individuals that is considered more than adequate in the event of a nuclear accident.

In making these joint FAO/WHO recommendations, the following assumptions were made in calculating the recommended levels:

■ 5 mSv was the reference level of dose.

■ 550 kg of food was consumed in a year, all of which was contaminated.

■ Unit intake factors for the radionuclides of concern (^{131}I, ^{137}Cs, ^{134}Cs, ^{90}Sr and actinides) could be conveniently divided into two classes, the actinides with a dose per unit intake of 10^{-6} Sv/Bq and all others with 10^{-8} Sv/Bq.

Applying these assumptions to the above formula, the level for "other" radionuclides would be:

$$\frac{5 \times 10E^{-3}}{550 \times 10E^{-8}} = 909 Bq/kg$$

which could then be rounded to 1000 Bq/kg. For the actinides this value would be 10 Bq/kg, as the dose per unit intake factor was 100 times larger.

It was recognized that the infant poses a special problem as a result of its sensitivity. It was felt that 1000 Bq/l does not adequately protect the infant when drinking milk contamination with ^{90}Sr since the dose per unit intake factor was of the order of 10^{-7} Sv/Bq. For this reason, a level of 100 Bq/kg was proposed for ^{90}Sr in milk and infant food. ^{131}I in milk was judged to be of less importance even though the dose per unit intake factor was higher for infants. If the value of 1000 Bq/l were applied, the infant would need to consume approximately 18 litres of milk contaminated to this level to exceed the reference level of dose. At 0.75 l/day, this represented about 24 days of ingestion of milk contaminated to this level. This was not considered to be a likely eventuality and in view of its short etfective half life no special values were suggested for ^{131}I in milk and infant food.

The levels that were proposed are shown in the box below:

Dried or concentrated products were to be considered on the basis of the food prepared for consumption. The level given would therefore be multiplied by the same factor used for dilution or reconstitution.

The levels were based on very conservative assumptions and were intended to be used as values below which no food control restrictions need to be applied. Measured values above those levels were not necessarily of public health concern but would alert the competent food control authorities for the need to assess the potential health detriment.

The levels were also intended to be applied to accident situations and not to naturally occurring radionuclides in foods.

The levels suggested were designed to apply particularly to foods in international trade, but both FAO and WHO called attention in their expert meeting reports to special consideration which might apply to certain classes of food which were consumed in small quantities, such as spices. Some of those foods grown in areas affected by the Chernobyl accident fall-out contained high levels of radionuclides following the accident. Because they represented a very small percentage of total diets and hence would be very small additions to the total dose, application of the suggested levels to products of that type could be unnecessarily restrictive. This matter was left in abeyance awaiting further consideration.

Proposed FAO/WHO levels for Radionuclides in Food moving in international trade

Actinides in milk and infant food	10 Bq/kg
^{90}Sr in all food	100 Bq/kg
^{131}I in Milk and infant food	1000 Bq/kg
All other radionuclides	1000 Bq/kg total gamma activity

For the present, the recommended levels arrived at following Chernobyl are the Guideline Levels adopted by the Codex Alimentarius Commission for use in food moving in international trade. They are also the levels adopted by other organizations concerned with radiation protection in their basic safety texts.

In addition to the establishment of limits for radioactive contamination of food, FAO, through its Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture developed guidelines for countermeasures to be taken to alleviate the agricultural consequences of a nuclear accident. These are:

■ To establish a general strategy for the introduction of countermeasures following an accidental release;

■ to compile and collate data on available techniques; and

■ to provide assistance for Member States to prepare guidelines specific to their circumstances.

The most important considerations are to protect human health by avoiding or reducing radioactive contamination of agricultural products and to keep affected land in some sort of production, returning it to normal usage if at all possible.

The Joint FAO/IAEA Division has also assisted in the application of one particular countermeasure in Belarus, the Russian Federation and the Ukraine; the use of Prussian blue to reduce ^{137}Cs contamination of cattle products. Prussian blue effectively binds Cs and a 200 g bolus introduced into the first stomach of cattle is a simple, safe and cost effective means of reducing ^{137}Cs in milk and meat. The governments of these countries have undertaken to use this technology at the small farm level. ■

Note: *The technical detail used in this article has been extracted from a paper titled, 'Proposed FAO/WHO Levels for Radionuclide Contamination of Food in International Trade' March, 1988 prepared for the information of the Codex Alimentarius Commission.*

ILO and the Prevention of Industrial Accidents

Measures to protect workers, the public and the environment against the risk of major industrial accidents were taken by the 80th Session of the International Labour Conference which ended in Geneva on 22 June 1993 - a session focusing primarily on social protection, employment and human rights issues.

The Conference adopted an International Labour Convention and Recommendation on the prevention of major industrial accidents.

Prevention of major industrial accidents

The new Convention on the prevention of major industrial accidents requires ratifying States - in consultation with the most representative organizations of employers and workers and other interested parties who may be affected - to formulate a coherent national policy for the protection of workers, the public and the environment against the risk of major accidents. This policy shall be implemented through preventive and protective measures for major hazard installations and, where practicable, promote the use of the best available safety technologies.

Employers are required to identify any major hazard installation within their control, notify the competent authority, and maintain a major hazard control system including provision for the identification of hazards and assessment of risks, technical measures such as design and safety systems, organizational steps such as staff training, emergency plans and procedures, and measures to limit the consequences of a major accident.

Taking into account information provided by employers, the competent authority shall ensure that emergency plans and procedures containing provisions for the protection of the public and the surrounding environment are established; it shall also ensure a public information and warning system.

The convention also sets out the rights and duties of workers and their representatives, including the right to interrupt an activity where they have reasonable justification to believe there is imminent danger of a major accident.

UN/M. Tzovaras Photo

The convention does not apply to nuclear installations and plants processing radioactive substances - except for facilities handling non-radioactive substances - to military installations, or to transport outside the site of an installation other than by pipeline.

The accompanying Recommendation provides for an international exchange of information on major accidents and the necessary safety and organizational measures. The national policy should be guided by the ILO Code of Practice on the Prevention of major industrial accidents. Recognizing that a major accident could have a serious impact on human life and the environment, it calls on countries to promote systems to compensate workers as quickly as possible after the event, and address adequately the effects on the public and the environment.

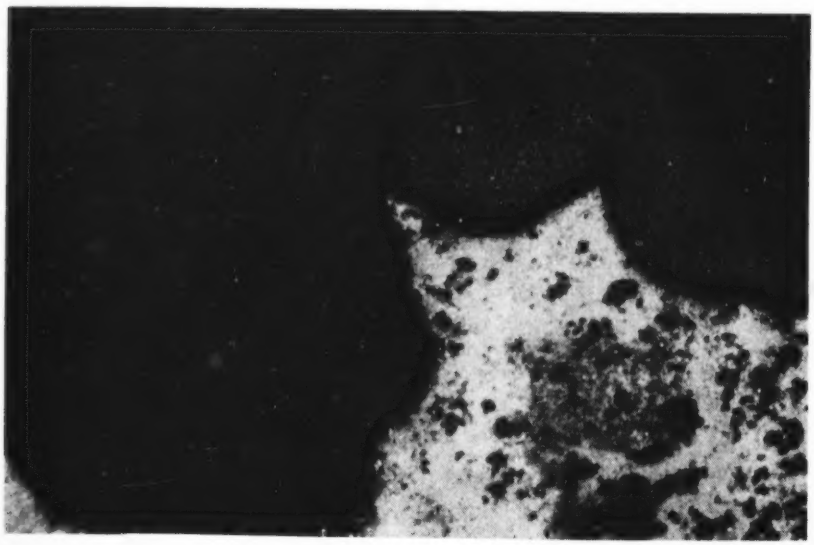
In a resolution, the Conference recognized that increased exposure to and use of biological agents at work required measures to be taken to minimize the risks to workers, the public and the environment. It asked the ILO to address the issue and consider the need for new international standards. (ILO, Press Release, 22 June 1993). ■

In accordance with the decisions taken by the Governing Body of the ILO at its 244th Session (November 1989), a meeting of experts was convened in Geneva from 8 to 17 October 1990 to draw up a code of practice on the prevention of major hazards. The meeting finalized and adopted a code of practice providing practical recommendations for all those who have responsibility for the prevention of major industrial accidents "Prevention of major industrial accidents". (ILO - Geneva, 1991).

IMO fund helps fight pollution disaster

A victim of the spill IMO Photo

A number of ecologically-imported sites in Saudi Arabia have been saved from the effects of massive oil pollution by a special fund established by the International Maritime Organization (IMO).



Crude oil IMO Photo

The sites include breeding grounds for local birds and animals, mangroves and salt marshes. The fund is currently being used to test alternative clean-up techniques on different types of shorelines.

The IMO Persian Oil Pollution Disaster Fund was established on 15 March 1991 by the Secretary-General Mr. William A. O'Neil. The crisis began in January of that year when it became known that a huge amount of oil had been released into the sea. This is estimated to have amounted to between 6 and 8 million barrels (up to 1m tons) making it the biggest oil spill in history.

It was clear that a spill of this size could have a disastrous impact upon the environment and that it could only be tackled on an international scale. It was, in fact, the type of disaster that had been envisaged just a few months before when the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC) was adopted

at a conference held at IMO headquarters.

The purpose of the Convention was to improve the ability of the international community to deal with major oil pollution incidents. It assigned an important co-ordinating role to IMO itself and a resolution adopted at the conference called upon the Secretary-General to implement some of its measures without waiting for the Convention to enter into force.

As soon as the extent of the disaster became known a number of Governments contacted IMO to offer assistance in dealing with the incident. The Government of Saudi Arabia also asked IMO to screen the many offers of assistance that it was receiving and other governments in the region asked IMO to initiate international action to combat the spill.

As a result, IMO established a Co-ordination Centre within the Marine Environment Division and the Governments of France, Japan, the United Kingdom and the United States made personnel available so that the centre could be kept open on a seven-day week basis. Shell International provided computer experts to develop a software programme for drawing up inventories of materials, equipment and expertise.

IMO also made local arrangements to co-ordinate assistance with Governments in the region. Liaison officers were established with personnel provided by Canada, and the United States at the Damman operations centre of Saudi

The contributors to the fund

The following countries have contributed to the IMO Persian Gulf Oil Pollution Disaster Fund:

Canada	Can $	0.25 million
Denmark	US $	0.15 million
(+ services in kind)		
Commission of European Communities	ECU	1.0 million
Japan	US $	1.5 million
Netherlands	DG	1.25 million
Switzerland	SFr	0.3 million
United Kingdom	£	1.0 million
Luxembourg	LuxF	40.0 million
(for purchase of oil spill equipment and services)		
China	Equipment	
Germany	Equipment	

Oil on the beach of Karan Island; an important breeding ground for the rare green turtle.

IMO Photo

A heavily impacted beach area.

IMO Photo

Arabia's Meteorological Environmental Protection Administration (MEPA) and the provisional office of the Regional Organization for the Protection of the Marine Environment in Bahrain.

As the scale of pollution became known, several IMO Member States called upon the Organization to establish an international fund for clearing up the spill which, within a few weeks, had spread some 180 kms down the coast. The main purpose of the fund was to facilitate the rapid deployment of equipment and services and to save areas which, for environmental reasons, were most at risk and to catalyse the efforts of coastal States in responding to the spill.

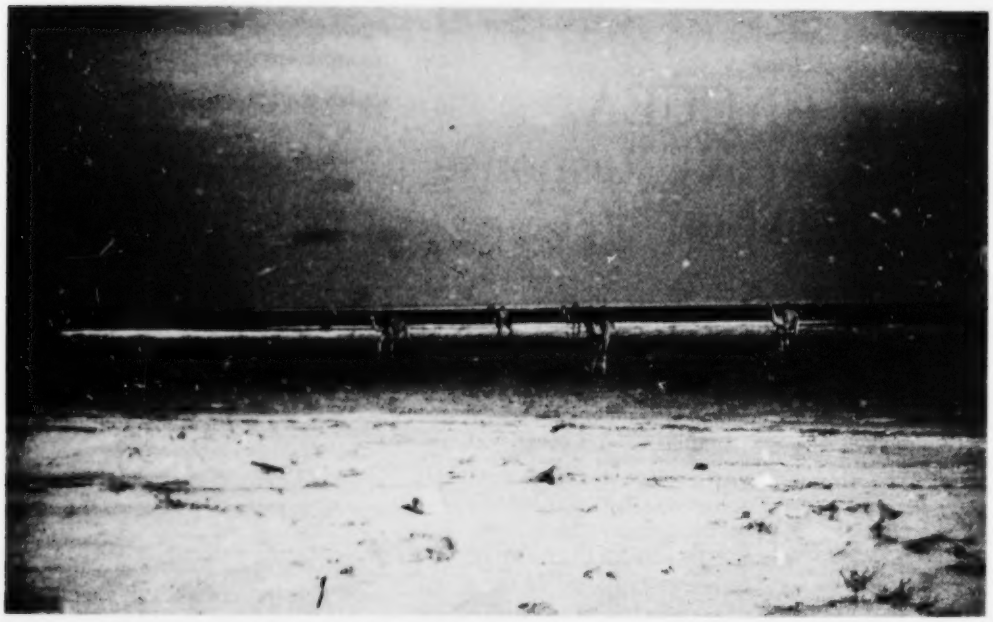
Over US $6 million was contributed to the IMO Fund in cash or kind.

In Saudi Arabia itself, MEPA led the national response to the disaster assisted by an International Interagency Assessment team (IIAT) which continuously gathered information on the movement and extent of the oil spills and provided recommendations to MEPA on response measures. The IIAT was originally led by personnel from the United States Coast Guard then starting in May by IMO. Support continued to be provided to the IIAT for several months by the United States and other Governments including the European Community.

The sites selected for clean-up using the IMO Fund were identified by the Organization's on-scene project co-ordinator in close consultation with the Saudi Arabian authorities and then approved at IMO headquarters.

These projects included the cleaning of oiled shorelines of Karan Island, an important breeding location for endangered species of turtles and migrating birds; upgrading containment boom protection at one of the few

The IMO oil spill co-ordination centre: the centre was activated as soon as the scale of the disaster became known and acted as a crucial link between authorities on the spot and governments and commercial companies wishing to assist the clean-up operation.



The beach after the clean-up operation.

IMO Photo

remaining undamaged salt water marshes at Saffaniyah Bay and protective booming for two unoiled salt water marshes in Musharrabah Bay; flushing of oil from the mangroves and natural water inlets on Gurmah Island and the mangrove nursery in Khafji; test and evaluation of clean-up techniques; and removal of several thousand barrels of standing oil in Dawhat Ad Dafi Bay.

On the remote location of Karan Island, 14,000 cubic metres of oil and tarmac has been removed from shoreline areas to allow turtles pollution-free access to nesting sites. Oil on turtle nesting beaches could have had significant impact on turtle egg viability and survival of the young turtle hatchings. Clean sand was used to re-establish the natural contour of the beach.

On Gurmah Island, free-floating oil flushed from heavily impacted areas of mangroves and tidal channels covering the southern portion of the Island. The oil was flushed to open water, using volume/low pressure techniques, where it was skimmed and collected for disposal. Containment boom was also installed to prevent re-oiling of the flushed areas.

In Saffaniyah Bay and Musharrabah Bay, oil-containment booms donated by the Governments of Germany and Luxembourg were installed to protect the few remaining areas of unoiled salt-marsh. The resources in these unoiled salt-marsh areas may be utilized for the future re-establishment of other heavily contaminated salt-marshes.

In Mussallamiyah Bay, a test site was established and a number of clean-up techniques were tested and evaluated in co-operation with the King Fahd University of Petroleum and Minerals. Results and recommendations on the most appropriate techniques to be used on various types of oiled shoreline will be provided to MEPA to assist in their future clean-up activities.

In Dawhat Ad Dafi Bay several thousand barrels of standing oil were recovered at two key sites. Prior to the clean-up, the oil had the potential to re-float during high tide and cause further pollution damage to the environment.

In the Al-Khafji mangrove nursery, high volume/low pressure water was used to flush oil out of the area in an effort to save as many plants as possible and to enhance the recovery of the area for future nursery activities. There are approximately 15,000 plants in this area, some of which were imported from other countries.

On Jazirat Al Toyor Island, characterized by an abundance of shrubs and other vegetation providing nesting and feeding habitats to birds and other Fauna, heavily oiled shorelines were cleaned up by using non-toxic oil released agent together with oil containment booms.

In Jazirat Al Maqta, an area with a relatively rich ecosystem with a great diversity of life, the removal of oil-tar layer from selected lengths of the beach was undertaken.

Current projects include development and testing of alternative oil clean-up techniques which may prove effective and efficient on the various types of oiled shorelines. These include the use of mechanical methods and the possible use of bioremediation in locations where the recovery of the shorelines environment may benefit.

A package of oil spill clean-up equipment donated by China and Luxembourg was provided to the Government of Kuwait, which had lost all its own equipment due to the hostilities in the region. ■

DHA and UNCUEA Strengthen Emergency Response Co-operation

The main thrust of the Department of Humanitarian Affairs (DHA) and the United Nations Centre for Urgent Environmental Assistance (UNCUEA) co-operation was summarized in a text on "Proposed collaboration" between UNCUEA and DHA-Geneva, signed in April 1993.

Observing that "close collaboration will be to the benefit of both partners", the text states that UNCUEA would work directly with and complement the various branches of DHA-Geneva. "This would ensure that the environmental impact of emergencies is fully considered by DHA and the UN system, and provide the means to ensure an appropriate international response, when required. It would increase the capacity of the UN system as a whole while facilitating the integration and rationalization of efforts, expertise, information and other support systems."

Among the specific areas of co-operation suggested were the establishment of a joint "hot line" for emergency notifications supported by an integrated 24-hour duty system, a common operations centre, inter-linked computer databases and information management systems, common logistical services and a maximum of common administrative support.

Good progress has been made in each of these areas. The most recent development is the agreement on the use of the common emergency "hotline". Countries facing emergency situations can call the Emergency DHA number (+4122) 9172010, thereby avoiding any delays which might occur due to deciding which agency to call for which kind of situation.

Integrated information systems is one of the oldest areas of co-operation. UNCUEA has long been active in the DHA-sponsored International Emergency Readiness and Response Information System (IERRIS). A collaborative effort by a number of international agencies and groups active in emergency response, the IERRIS initiative, has already resulted in a set of "proposed Principles for the Collection and Dissemination of Disaster Related Data" and a "Proposed Design for an IERRIS Disaster Information Systems Network."

To support operational co-operation, DHA-Geneva and UNCUEA have been working together since 1992 to develop a common information management system. This system provides for joint access to information on available international expertise and other capacities as well as on-going emergency response activities.

Dissemination of information to partner groups is also co-ordinated. DHA "Situation Reports" and "Information Reports" provide information on environmental emergencies, and the Environmental Emergency Response (EER) online information system carries all DHA Situation and Information Reports.

The close collaboration between DHA and UNCUEA reflects the complex nature of many emergencies. As exemplified by operational co-operation in Montenegro, the immediate cause of an emergency may be natural, the origin of the problem may be man-made, an emergency event such as an earthquake may involve complex humanitarian concerns as well as the specific component of a release (or risk of release) into the environment of man-made toxic substances. Drawing lines between these aspects at the time of response is often arbitrary or artificial. The close co-operation between DHA and UNCUEA is a natural, necessary and exemplary response to provide practical and well-managed international assistance in a timely, focused manner.

UNEP Governing Council Extends Urgent Environmental Assistance Experiment

After lively debate under a new Executive Director, countries call for a government advisory meeting to consider proposals for decision by mid-'94.

In May 1993, the UNEP Governing Council, in decision 17/26, extended the experimental stage of UNCUEA for an additional twelve months. Taking note of "the interest shown in the world of the Centre by Governments and international organizations," the Governing Council outlined a work programme, including three key tasks:

- "to identify the specific needs for emergency assistance of countries facing different types of emergencies leading to environmental damage",
- "to analyse all international response systems and capacities, to assess the ability of the United Nations and other organizations to respond to environmental emergencies and to identify the main gaps, based on a review of major disasters that have occurred in the last ten years", and
- "to develop ... a set of concrete proposals for the enhancement of the international response capacity, with a special focus on the improvement of the United Nations system" addressing "clear, practical and cost-effective modalities of collaboration and co-ordination" between UNCUEA and the other relevant United Nations bodies, particularly the UN Department of Humanitarian Affairs.

(Excerpts from UNCUEA - Environmental Emergency Update, July 1993).

UNIDO: Bridging the Transition from Emergencies to Sustained Industrial Development

by Patricia N. Sutter

In mitigating the many disasters and humanitarian emergencies around the world, the transition from the immediate relief phase to the long and painful process of economic recovery requires a rebuilding task of Herculean proportions. Immediate assistance involves the obvious, such as reconditioning equipment and machinery for processing vital food and medical supplies, repairing facilities for manufacturing materials for building shelters, and restoring communication lines. But before a truly cost-effective rehabilitation assistance programme can be launched, an accurate analysis has to be made of the complexities of the situation in the field, the new capacities and policy initiatives required, as well as the overall socio-economic development goals to be set in the affected region.

As the specialized agency that co-ordinates all industrialization matters within the United Nations system, the United Nations Industrial Development Organization (UNIDO) has extensive experience in helping steer countries along the road to sustained industrial development. For more than 25 years, UNIDO has been breathing new life into hundreds of decaying production plants, injecting new vitality into neglected industrial sectors and laying the basic infrastructure on which manufacturing and employment-creation depend.

UNIDO collaborates with the major humanitarian and relief aid agencies, relevant government authorities, non-governmental organizations and the private sector to ensure that a sound industrial rehabilitation strategy is integrated into the long-term recovery programme of countries facing dire emergencies. This partnership encourages shared responsibility in identifying the most pressing needs in disaster-stricken areas and in mobilizing scarce financial resources from the international community.

UNIDO responds to requests for post-disaster rehabilitation using the same three-tier approach in promoting industrial development: It provides policy advice, institutional support and enterprise-level technical assistance. Its expertise in undertaking research and feasibility studies and in identifying joint venture partners adds impetus to industrial investment schemes that can accelerate a country's recovery.

Afghanistan

In Afghanistan, which is emerging from 14 years of strife, UNIDO has been asked by the United Nations Office for Rehabilitation Strategy (UNORSA) to take the lead in formulating the industrial component of the rehabilitation action plan. UNIDO has come up with a portfolio of promising projects. But before they can go forward, a comprehensive assessment of Afghan industries will be carried out analyzing their potential for regeneration in light of available natural and human resources and the delicate socio-political situation. Focusing on meeting the basic needs of people hardest hit by the war, UNIDO is devoting its topmost attention to spurring economic activity in industries dealing with agro-industrial supplies, leather goods, textiles, wood and carpentry products, building materials and simple metal work.

Chernobyl

UNIDO has also been actively participating in the Inter-Agency Task Force to reduce the consequences of the nuclear accident at Chernobyl since it

was created in 1991. As an initial measure, UNIDO proposed a survey of the industrial sector in Belarus, the Russian Federation and the Ukraine following a mission to these three affected countries in 1991. UNIDO recently approved US $150,000 from in-house resources, a third of the necessary funds, making it possible for a team of international and national experts to start the survey in Belarus, which suffered the most damage from the fall-out. The conclusions and recommendations should enable government authorities to complete short- to medium-term plans and programmes for industries requiring crucial assistance. UNIDO expects its diagnosis to serve as a framework for a broad-scale industrial recovery programme, in turn boosting the fund-raising appeals of the Inter-Agency Task Force on Chernobyl. Other projects being promoted by UNIDO will assist baby food production, processing of manufacturing construction materials for suitable housing, and small-scale private enterprises and entrepreneurship training to generate jobs.

In providing technical assistance to strengthen industrial capacity, UNIDO places great emphasis on the transfer of carefully selected technology that will continue to serve its purpose even in the longer term. In Croatia, a tried-and-tested concept in building shelter is designed to offer a lasting solution to the housing problem. In Armenia, a US $4.9 million cold storage facility for meat and food supplies uses environment-friendly substances. In several earthquake-prone countries, building systems using earthquake-resistant materials and designs are being developed and promoted. In all these projects, training of national managers and personnel is an essential part of the package of technical assistance.

Whether the assistance is meant to alleviate the unfortunate consequences of a natural calamity, a man-made catastrophe or war, the guiding philosophy of UNIDO, as shown in the following project, is simple: Even as relief and humanitarian aid is still pouring in, the sooner industrial activities can get a jump-start, the sooner people's lives acquire a semblance of normalcy. The more self-confident disaster victims become, the more responsibility they can assume in rebuilding their communities. For these efforts to be self-sustaining, however, UNIDO deems it essential to design post-emergency programmes with an eye to the future.

Fortifying the Life-Line of Sarajevo

Following its remarkable track record in revitalizing the bakery production chain in Luanda, Angola, and in starting up a modern bread-making industry in Maputo, Mozambique, UNIDO has turned its attention to another troubled corner of the world: Sarajevo.

The need is crucial, according to the recent report of the UN Revised Consolidated Inter-Agency Appeal for Former Yugoslavia, covering April to December 1993. In Bosnia-Herzegovina alone, an estimated 2,280,000 people are currently dependent on emergency food assistance. Malnutrition is common and cases of scurvy, folic acid deficiency and anemia are on the rise.

UNIDO is co-operating with UNICEF to ensure that the bread baked and distributed in Sarajevo is enriched with vitamins and minerals. The impact of this joint activity is likely to be immediate as the hub of operations is Sarajevo's central industrial bakery, which turns out 115,000 bread loaves a day for a population of 250,000.

The project demonstrates to donor governments and private groups that their donations of food supplies - in this case, flour - can serve as the life-line of a besieged community. With a minimum of effort and without any need for new equipment, the bakers prepare the dough in the usual manner, while simply adding a concentrate of micro-nutrients pre-mixed at levels recommended by the World Health Organization.

Looking ahead, UNIDO plans to improve the nutritional value of the bread in Sarajevo even further by enriching it with soya bean or milk proteins. Soon, too, the overworked bakery - the only one serving Sarajevo since the start of hostilities will have to be helped in obtaining spare parts and maintenance for old and worn-out equipment.

UNIDO hopes to replicate the Sarajevo bread scheme in other bakeries and food processing units in the rest of the war-affected region, especially enterprises with the proven capacity and willingness to manufacture processed foods for refugee camps. UNIDO has also drawn up plans to improve the production of other vital food supplies based on cereals, milk and other basic raw materials. This time the goal would be to reach as many refugees and displaced people as possible in Bosnia-Herzegovena and Croatia - an estimated three million at last count.

Building for the Present and the Future in Croatia

Using its experience of more than 25 years in assisting the wood industry in developing countries, UNIDO is constructing disaster-relief housing designed to fit the immediate and future needs of homeless families in Croatia.

UNIDO is introducing a building system that is in wide use in North America, Scandinavia, Australia and New Zealand. The system offers a speedy, efficient and low-cost way of constructing homes in emergencies; at the same time, the light timber framing provides a durable core which can be improved and expanded once the emergency phase is over. Since all the building elements are light, no heavy-duty construction equipment is necessary. The labour-intensive work involved and the use of locally available material provide a catalyst for economic activities in disaster- affected zones.

The Government of Croatia and UNIDO selected the towns of Vinkovci

UNIDO Photo

With technical help from UNIDO, a shoe factory and a tannery in Tete, have become symbols of hope for better economic time ahead.

and Osijek in Eastern Slavonia, with their ruined villages and 20,000 homeless, as sites for the pilot housing project. With the financial support of the Italian Government, a workshop was set up in Vinkovci to prefabricate the building elements for a 600 square-metre school which will be used as a temporary shelter for refugees. Work will soon start on another smaller shelter in Slavonski Brod. Local builders and architects, together with trainees from a vocational school, are being taught how to produce and assemble the various components and how to design and plan different kinds of buildings. Once sufficiently familiar with the new technology, this trained work force will be able to continue building without the guidance of UNIDO experts.

UNIDO is confident the houses will gain wide acceptance not only in the short term but as future permanent dwellings. If more factories can be built to prefabricate timber wood frames, such as the one in Vinkovci, or if similar facilities can be added to existing sawmills and wood processing plants, the local wood industry could very well help lay the groundwork for the long reconstruction process ahead.

The Tannery in Tete Mozambique

Defying all odds, an enterprising family has been able to start up one of the first privately owned small enterprises in Mozambique. Backed by the UNIDO and the Danish Aid Agency, DANIDA, a leather processing plant and an adjoining shoe and leather goods factory have become symbols of hope for the residents of the northern province of Tete, who have seen only deterioration and scant development in recent years.

Previous to this, the local population and the city slaughterhouse were at a loss about what to do with rotting animal skins and hides on the streets and in garbage sites. Today, the Tete tannery pays for them and processes them into export-quality leather. More than 60 jobs have been created. And, in a country where skilled labour is hard to find, every employee has benefited from on-the-spot training in leather and shoe production.

Plans for the project were drawn up in late 1988, a year after Mozambique launched its Economic Rehabilitation and Development Programme, which is sponsored by the World Bank and the International Monetary Fund. By 1990, UNIDO had supplied, installed and tested the equipment for the tannery and the shoe manufacturing unit. Strict discharge standards were put in place to protect the Zambezi river from being polluted by chemicals used in treating skins. In mid-1991, the tannery was operating in full gear and, almost immediately, the first pairs of shoes were ready to go on the market.

The tannery owners realize that the limited purchasing power of most of the population has turned shoes and leather goods into veritable luxury consumer items. The price of a pair of shoes is only just below the average minimum monthly salary, "but somehow there is a market; people do save", explains one of the family members.

There is one dividend the tannery staff is counting on: peace. Indeed, under the project's second phase, attention will be given to training in management and marketing in the expectation that the family enterprise will grow beyond its modest origins.

The tannery in Tete is proof that a measure of economic progress is possible even in times of instability. Encouraged, UNIDO is keen to launch two programmes promoting small businesses in co-operation with Mozambique's Institute for the Promotion of Local Enterprises (IDIL). Using a similar concept envisioned for Angola, projects are being designed to set up workshops in agro-industry and metal-processing and to re-train some of the 20,000 demobilized Mozambican soldiers who will soon have to be reintegrated into civilian society.

■

Chemical Accidents: International Activities

*Prepared by Dr J.A. Haines**
WHO/UNEP/ILO International Programme on Chemical Safety (IPCS)

There is nothing new about chemical accidents, only their character which has changed with human development. When humans first started using fire and harnessing its potential, disasters occurred, to which our archeological records bear witness. Gunpowder was invented in China during the Middle Ages, and its use spread throughout most parts of the world. Accidental ignition during manufacture, storage and transport were among the earliest disasters from man-made substances. With the Industrial Revolution, explosions were early manifestations of chemical disasters.

However, it was the very rapid advances in chemical engineering and chemical synthesis during the last 30 or 40 years, as well as the large-scale uses of energy, that have led to the production, storage, transport, use and disposal of significant quantities of hundreds of different toxic chemicals throughout the world. This has considerably increased the potential for chemical accidents not only in densely-populated, urban, industrialized areas, but in many rural and even remote regions of the world. Moreover, it was the series of major accidents involving chemicals, such as: Seveso, Italy, in 1976; the Spanish toxic oil syndrome in 1981; the propane explosion in Mexico City in 1984; culminating in the Bhopal disaster in 1984, which gave stimulus for developing international

WHO/Publifoto

The Seveso disaster in Italy. Specialists in the field of chemical poisoning are trying to clean the plant from which the terrible gas escaped, harming nature, animals and man.

activities in this field of chemical emergencies.

When a chemical disaster occurs many people may be involved either directly or indirectly, killed, injured or displaced from their homes. The environment may also be severely and extensively damaged. In many instances, the disaster is sudden and unexpected, and it causes confusion and chaos, often accentuated by the lack of preparedness of the authorities and the public. The uncontrollable involvement of the public, relatives of the injured and the mass media may add more drama and chaos to a situation which requires extreme calm and organized actions. It is therefore essential for each country to recognize, not only the possibility of major chemical accidents, but also the exact role which must be played by each authority in order to respond to such accidents. Much of the international work in the field of chemical accidents is directed towards providing appropriate guidance and technical support to the responsible authorities

First United Nations Conference on Environment

Intense concern, not only of the scientific community but also of the public and governments, about the dangers of chemicals for humanity and the environment was brought to the international forum of the 1972 United Nations Conference on the Human Environment, held in Stockholm, Sweden. This Conference recommended that international programmes be undertaken for early warning and prevention of the harmful effects of chemicals, as well as for the response to disasters. Among the variety of international chemicals-related activities being undertaken in the early 70's, were those of the International Labour Organisation (ILO), concerned with occupational health and safety, and those of the Organisation of Economic Cooperation and Development (OECD), concerned with the environmentally-sound management of chemicals. As a result of the Stockholm Conference, the United Nations Environment Programme (UNEP) was established which, within a few years, set up its International Register of Potentially Toxic Chemicals (IRPTC) for chemical information, and its Industry and Environment Office to bring together governments and industry for the promotion of environmentally-sound industrial activity.

IPCS: A Joint Venture for Chemical Safety

In 1980, ILO, UNEP and WHO agreed to undertake a collaborative endeavour in the field of chemicals, and established the International Programme on Chemical Safety (IPCS). This programme was set up to provide assessments of the risks to human health and the environment by chemicals, thus providing the internationally-evaluated scientific basis on which Member States may develop their own chemical safety measures. The programme also seeks to strengthen national capabilities to prevent and treat harmful effects of chemicals and to manage emergencies involving chemicals.

Work on emergency response to chemical accidents was initiated by the World Health Organization's Regional Office for Europe (WHO/EURO) in the early 1980's when it issued a document on Administrative Guidelines on Planning Emergency Response Systems for Chemical Accidents (Health Aspects of Chemical Safety, Volume 1). In 1985, the IPCS initiated its work on strengthening national medical capabilities for diagnosis and treatment of chemical poisoning, which has resulted in: the development of the IPCS-INTOX computerized poisons information package; the preparation of a series of monographs on antidotes; guidelines on poison information centres and their role in chemical emergencies; and the preparation of an annotated checklist on information useful for identification of hazards during the manufacture, storage, transport and disposal of substances. Work is continuing in these areas and on the establishment of comparable harmonized basis for collecting follow-up medical data on victims of chemical accidents. Within WHO, the IPCS provides the technical inputs on chemicals for the WHO Programme on Emergency Preparedness and Planning.

WHO's Regional Initiatives

During the late 1980's the WHO Regional Office for Europe undertook a number of initiatives. A World Conference on Chemical Accidents was held in Rome in 1987, the proceedings of which have been published. A guide for public officials on rehabilitation following chemical accidents was issued in 1989. Other WHO Regional Offices, particularly those for the Americas, for the Eastern Mediterranean, and for the Western Pacific, subsequently developed regional chemical accident activities.

UNEP's APELL Process

In late 1986, the UNEP Industry and Environment Office started its work to help governments, particularly in developing countries, to minimize the occurrence and harmful effects of chemical accidents and emergencies related to industry. In cooperation with industry, a Handbook on Awareness and Preparedness for Emergencies at Local Level (APELL) has been prepared, which is designed to assist decision-makers and technical personnel in improving community awareness of hazardous installations, and in preparing response plans, should unexpected events at these installations endanger life, property or the environment. A series of seminars and training workshops on the application of the APELL handbook are being organized by UNEP in each region of the world.

OECD's Chemical Accident Programme

In 1988, OECD held a high-level conference on Accidents involving

Hazardous Substances, following which the OECD Chemical Accident Programme was set up, whose mandate included the development of guidance on the prevention of preparedness for and response to accidents involving hazardous substances, including the special issues associated with investments and aid programmes related to hazardous installations in non-OECD countries. A series of workshops was held during 1989-1991 to address the range of issues associated with accident prevention, preparedness and response, and to consider the roles and responsibilities of the various parties who are necessarily involved in such activities, i.e. government authorities at all levels; industrial managers of hazardous installations; other employees at these installations; and the potentially affected public. These workshops provided the basis for the OECD Guiding Principles for Chemical Accident Prevention, Preparedness and Response, published in 1992. These Guiding Principles deal essentially with accidents at fixed installations. Jointly with UNEP, an international directory of emergency response centres has been prepared.

Four Organizations Co-operate on Health Aspects of Technical Accidents

In April 1993, the IPCS, WHO Regional Office for Europe, OECD and UNEP Industry and Environment Office jointly organized, in Utrecht, Netherlands, a Workshop to develop guidance for the health sector on preparedness for and response to major chemical accidents. As a result of this Workshop, three types of guidance document will be published by the end of the year: "General Principles" for the government administrator and decision-maker; "Practical Guides on Medical and Health-Related Issues" for the health professionals involved in chemical accident preparedness and response; and a "Checklist" to assist health and environmental authorities to develop and test their own chemical emergency plans.

This child suffered severe burns through accidentally coming in contact with chemical by-products.

WHO/Publifoto

A series of training workshops based on these documents are planned in various parts of the world from 1994 including in Jordan for countries of the Middle East, in Uruguay for Latin American countries, and in Korea for Asian and Western Pacific countries.

Environmentally Sound Management of Chemicals

Twenty years after the Stockholm Conference, the United Nations held its Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil, in June 1992. Environmentally-sound management of chemicals is one of the areas where an international strategy has been developed. Risk reduction is one of the components of that strategy. Part of risk reduction is the prevention, preparedness and response to chemical disasters, prevention of poisoning by chemicals, and the undertaking of toxicovigilance and coordination of clean-up and rehabilitation of areas damaged by toxic chemicals. The recommendations of UNCED in this area call *inter alia* for governments, in cooperation with international organizations and industry, to promote establishment and strengthening of adequate facilities in countries for dealing with chemical emergencies.

UNCED has designated the IPCS to be the nucleus for increased international co-operation and accelerated work in the field of environmentally-sound management of chemicals. Improved coordination mechanisms will be developed and an Intergovernmental Chemical Safety Forum is expected to be established at a meeting of governments, to be held in Stockholm, Sweden, in April 1994. It would meet regularly, so that governments may discuss, on an intersectoral basis, policy matters relating to chemicals, including chemical emergencies. ■

**WHO staff member responsible for work of IPCS in the field of chemical emergencies.*

DHA at WORK

Relief: Mobilization and Co-ordination

● **Afghanistan - Mudslides**: On 15 June, heavy rains triggered mudslides in the Chindawal district, south of Kabul. Reports indicated that the mudslides killed 80 people, destroyed about 60 houses, and rendered up to 1,000 people homeless. DHA-Geneva issued two Information Reports.

● **Bangladesh - Tornado:** A tornado, with wind speeds exceeding 160km/h, hit eastern Bangladesh on 13 May. The tornado claimed 14 lives and rendered 7,500 homeless. DHA-Geneva issued one Information Report.

● **Cuba-NeuromyelopathyEpidemic:** An epidemic of subacute disease of the nervous system is affecting approx. 40,000 people. Symptoms include partial loss of vision, incontinence, muscular fatigue and, in most severe cases, paralysis. The epidemic, that developed over a period of several months, has been declared an emergency situation. The local response to the epidemic was hampered by the impact of the tropical storms/floods which hit the country in March. On behalf of WHO/PAHO, DHA-Geneva issued an appeal for international assistance and 3 Situation Reports.

● **Eritrea - Hailstorm:** International assistance was mobilised for the victims of the hailstorm that struck the port city of Massawa in April. Four Situation Reports were issued. DHA-Geneva reported that contributions totalled more than US $2.5 million.

● **Georgia**: DHA-Geneva issued two Situation Reports covering the consequences of the civil strife in Abkhazia and South Ossetia as well as the increasing needs of displaced persons and vulnerable groups. The Governments of Denmark, the Netherlands, Norway and the Russian Federation donated a total of US $1.4 million.

● **Emergency Airlift to Georgia:** On 23 March, a first shipment of emergency relief items arrived in Tbilissi and Tskhinvali (South Ossetia). DHA organized a second emergency airlift to the region of Abkhazia. The plane, loaded with basic relief items, arrived on 25 June in Sukhumi. The DHA field delegate handed over all material to representatives of the State Committee for the Autonomous Republic of Abkhazia and of the Humanitarian Commission to Abkhazia for the Parliament of Georgia. The total value of this operation amounted to approx. US $200,000. The relief items were donated by the Governments of Italy and Norway.

● **Jamaica - Floods:** Heavy rainfall in late April and early June caused flooding in several areas. Eight people were reported dead, 82 families were rendered homeless and 4,290 families were affected. Reports indicated extensive damage to roads, bridges and agriculture. DHA-Geneva issued two Information Reports.

● **Kazakhstan - Floods:** In April and May, extensive floods caused major damage to local infrastructure and livestock. This calamity claimed ten lives, and rendered 30,000 people homeless. The heaviest losses were sustained in the Atyrayskaya, Zapadno-Kazakhstanskaya and Aktjubinskaya regions. After exhausting all its own resources, the Government of Kazakhstan requested the assistance of the international community. DHA issued four Situation Reports. Italy, Japan, Luxembourg, Switzerland and the United Kingdom responded by providing assistance through DHA.

● **Kyrgyzstan - Floods/Landslides:** The UNDP Resident Representative in Kyrgyzstan issued a report stating that heavy rains on 10-13 June caused wide-spread floods and landslides in many parts of the country. The total damage was estimated to be close to US $50 million. In southern Kyrgyzstan, ten people were reported dead, and 480 houses destroyed.

● **Mongolia - Snowstorms:** The western part of the country was severely affected by snowstorms in late March/early April. DHA launched an appeal for international assistance. As of June, contributions to the affected areas, announced to or channelled through DHA, reached US $1,115,000. Three Situation Reports were issued.

● **Mozambique**: A DHA mission went to Mozambique in May to work out procedures with UNOHAC and UNOMOZ for the effective management of the UN Trust Fund for Humanitarian Assistance. The Fund is intended to finance programmes in the following areas: reintegration of demobilized and displaced populations, mine clearance, and humanitarian assistance. As of 21 June, the Fund totalled US $24 million. Pledges and contributions were made by the Governments of Italy, the Netherlands, Sweden and Switzerland.

○ The Under-Secretary-General for Humanitarian Affairs co-chaired the donors meeting on the Consolidated Humanitarian Assistance Programme in Mozambique (Maputo, 8 to 9 June 1993), together with the Italian Under-Secretary of State for Foreign Affairs. Mr. Jan Eliasson met with the President of Mozambique, the Prime Minister and other authorities. While both the Government and RENAMO participated actively in the proceedings symbolizing their commitment to peace, most donors expressed serious concern about the delays in the implementation of the Peace Agreement.

● **Papua New Guinea - Bougainville Island Floods:** On 12-13 June, heavy rains caused flooding in the southern part of the island. 14,000 people were affected. Extensive damage to roads and bridges was reported. DHA-Geneva issued one Information Report.

● **Tajikistan - Floods**: Due to severe flooding in mid-May, one-fifth of the country's districts were declared disaster zones. DHA sent a two-man mission to assist the Tajiki Government in the evaluation of relief needs and co-ordination of international emergency assistance. DHA also organized an airlift of 35 tons of emergency relief goods from its Pisa warehouse. The airlift was financed by Italy. DHA purchased and delivered six complete WHO health kits given by Luxembourg. A disaster relief expert was assigned to a four-week mission in Dushanbe to assist the Head of the United Nations Mission of Observers to Tajikistan (UNMOT) and DHA delegate in preparing rehabilitation programmes. The mission, financed by the United Kingdom, included a US $50,000 operating fund.

Disaster Mitigation and Management Planning

● **Ecuador Landslide Dam Emergency: Report on Lessons Learned:** A DHA delegate took part in a meeting organized by the Swiss Disaster Relief Unit in Bern to review the report on the combined DHA/SDR emergency assistance to Ecuador in April and May 1993, where a huge landslide of 30 million cubic meters created a dam blocking 2 flooded rivers. This created a new lake where the water was backed up to 60 m above normal levels, causing the complete flooding of a thermal electricity generating plant, bridges, sewage system, houses and other infrastructure. The emergency discharge of water from this lake also heavily damaged a down river hydroelectric plant producing 80 % of the hydraulic energy in the country.

The report describes how the worst possible scenario was avoided by the creation of a water diversion channel which eroded the landslide dam. Within a week's time, river water levels returned almost to normal. The joint DHA/SDR technical report containing a suggested action plan is being prepared for submission to the Ecuadorian Government. It includes projects for land-use zoning, the preparation of hazard and risk maps, the organization of training seminars, and the strengthening of the relief intervention capacity of the Civil Defence.

● **A DMB staff member** participated as UN cadre trainer in the DMTP India Country Workshop held in Delhi in July. The Workshop was ration with the Indian Institute of Public Administration and the Department of Agriculture. Participants came from cyclone, earthquake and drought-prone States of India.The emphasis of the exercise was on disaster mitigation. Disaster scenarios for each possible calamity, prepared by resource persons from India were discussed in plenary. The cadre trainer's presentation dealt with principles and elements of disaster mitigation.

● **At the invitation of UNDP, Tehran,** a senior staff member of DHA's Disaster Mitigation Branch visited Iran in order to assess disaster preparedness and mitigation assistance needs in Iran.

Special Emergency Units

● **Angola:** The UN Consolidated Inter-Agency Appeal for Angola (in English & Portuguese) was simultaneously launched in New York and Geneva on 21 May and a Donor's Conference was held on 3 June.

● **Armenia:** The Consolidated UN Inter-Agency Humanitarian Programme was distributed on 7 June and launched at the Donor's Meeting on Humanitarian Assistance to Armenia on 10 June.

● **Azerbaijan:** The Consolidated UN Inter-Agency Humanitarian Programme was distributed on 7 June and launched at the Donor's Meeting on Humanitarian Assistance to Azerbaijan on 11 June.

● **Eritrea:** During a mission, which started in May, data was gathered for the Joint Government of Eritrea and UN Appeal for Eritrea. In this Appeal, a Programme for Refugee Reintegration and Rehabilitation of Resettlement Areas in Eritrea (PROFERI) was proposed. The Appeal was distributed on 22 June. A Pledging Conference took place on 6 July when the Appeal was launched.

● **New Independent States (NIS):** The First Situation Report on the NIS was approved by the Task Force and was distributed on 14 May.

● **Drought Emergency in Southern Africa (DESA):** The DESA Quarterly Report was distributed on 24 June to DESA countries, Member States, UN agencies and NGOs.

General Information

● **Co-ordinating Committee Meeting between DHA-Geneva and JICA:** On 8 and 9 June, a consultation team from the Japan International Co-operation Agency (JICA), visited DHA-Geneva. A series of discussions were held on the use of the Pisa Warehouse and the release of Japanese relief goods. Prior to the meeting, the team visited the Warehouse to inspect the Japanese relief materials in stock.

● **Use of Military and Civil Defence Assets (MCDA) in Disaster Relief:** A DHA officer attended the NATO Symposium on Military/ Civil Defence Co-operation in emergency operations, held in Oslo from 26 to 30 April, and presented updates on the Brussels' Workshop recommendations as well as on the field training "Exercise'93".

● **HCR Workshop on Refugee Shelters**: From 29 June to 1 July, DHA participated in the "First International Workshop on Improved Shelter Response and Environment for Refugee", organized in Geneva by the United Nations High Commissioner for Refugees (UNHCR). The aim of the meeting was to develop a shelter strategy.

Representatives from the New York Office

❍ Participated in the UNITAR-organized Third Annual Training Seminar on Peace-keeping from 17 to 21 May held at the campus of the Manhattanville College.

❍ Participated as trainer in the DHA/UNDP-organized Disaster Management Training Programme China Country Workshop held in Beijing, China, from 28 June to 2 July.

❍ Met the Rwanda Resident Co-ordinator/UNDP Resident Representative, Mr. Ahmadou Ly, on 4 June for discussion on current situation in Rwanda and on future course of action.

SPECIAL UNIT FOR IRAQ

During April and May 1993, implementation of activities envisaged under the UN Plan of Cooperation (1 April 1993 - 31 March 1994) were either scaled back considerably or were not begun due to lack of new funding. In view of this critical situation, a Consultation Meeting, with the participation of UN Agencies and Programmes, NGOs and donors, was held in Geneva on 1 and 2 June. Contributions of approximately US$40 million were announced. Donors were urged to channel contributions through the UN Escrow Account to generate matching funds from frozen assets held by the USA. DHA has agreed to channel funds for specific NGO activities within the framework of the Programme.

Discussions concerning the extension of the Memorandum of Understanding (MOU) have progressed. Agreement on principle between the UN and the Government of Iraq has been reached and will be formalized shortly.

Food is the most critical need at present as UN stocks are exhausted. In the North, due to the lack of supplies, distribution of food assistance by WFP during May continued for only 300,000 persons (internally displaced), while food was distributed to 450,000

persons in the Centre and South (supply is available to the end of July). Contributions for food and for the grain buy-back scheme announced by Canada, Sweden, EC, UK, and USA, will greatly assist in meeting immediate needs, if made available shortly. In addition, DHA has approved a loan to WFP of US $4 million from the Central Emergency Revolving Fund (CERF) for immediate use in the grain buy-back scheme.

FAO reported that aerial spraying for control of sunnpests among wheat and barley crops in the northern governorate of Niveneh and of date palms in the southern areas of the countries have been successfully completed by the end of May. In addition, ground spraying for control of sunnpests in the governorates of Dohuk, Arbil and Suleimaniyah were also completed. Harvesting of wheat and barley is in progress.

Prepositioning of fuel for the fall and winter are urgently needed.

Although no dramatic changes in the health situation were reported in May and June, it is to be noted that the shortage of drugs for chronic diseases remains acute. The UNICEF-assisted CDD campaign is successfully on-going. Malaria spraying was on-going in the northern governates, while prevalence rates continued to rise (15,000 primaquine tablets have been distributed).

No improvement in water quality was noted in the southern governorates. The installation of a compact water treatment plant in Amara was completed. OXFAM activities aimed at providing sanitation facilities to 300 schools in Basrah continued with completion expected in three months. UNICEF reported 20 sanitation projects completed in the Suleimaniyah and Dohuk Governorates.

In the education sector, approximately 3000 desks were distributed to 47 schools for 12,000 pupils. UNICEF supplied 15,000 copybooks for end-of-school exams. Education supplies are currently being distributed among 91,000 pupils in Arbil City. UNICEF has assisted with teacher refresher courses in Dohuk City and with tutorial classes for students (4,700) in Arbil City.

A UNESCO mission visited the country and made some modification to their proposed programme. The mission also discussed the issue of transporting Kurdish textbooks to the north. Distribution plan of UNESCO supplies was completed as well as school repair activities. Delivery is expected before the new academic year starts in October 1993.

Relief convoys originating from Turkey were reduced even further (now averaging about 5 trucks a day), transporting mainly non-food items (water and sanitation equipment, seeds for tree planting, fertilizer and basic health and education materials).

CARE Australia and UNICEF have reached agreement concerning logistical support for the UNICEF programme under the current Plan of Cooperation. A similar agreement is being finalized between CARE and WFP. CARE has also agreed with UNICEF to provide support for water supply and sanitation activities in the south. ICRC and IFCR have both issued appeals for support of their humanitarian activities in Iraq mainly in the areas of water supply and sanitation (ICRC) and basic health (IFRC).

With regard to security and the UN Guards Contingent in Iraq, the current strength of the Contingent in Iraq is 177. With the receipt of several new pledges, a new rotation plan has been finalized, which will result in an initial increase to about 200 Guards in July 1993. The following countries are continuing to provide personnel to the UN Guards Contingent in Iraq: Denmark, Nepal, Greece, Fiji and Austria. The Government of Poland has agreed to provide a medical team. The Danish Government has supported the cost of a new Chief for the Guards Contingent who will take up his post on 4 July 1993. Additional contributions received for UNGCI are sufficient for continued operations through August only.

A UN security advisor has visited Iraq in order to evaluate the security situation (particularly in the northern governorates) and to provide recommendations for improvements in the UN security arrangements.

The number of security incidents involving UN property and staff increased in late May and June 1993. These included hand-grenades thrown at UN offices and residences, deliberate damage to vehicles, as well as harassment of local staff. UNGCI reported the repeated shelling of villages in areas northeast of Suleimaniyah on the Iraq/Iran border.

HUMANITARIAN ASSISTANCE TO AFGHANISTAN (UNOCHA)

Serious fighting in Kabul between 8 and 22 May caused the loss of more than 100 lives, while close to 3800 injured received treatment in the city's five hospitals. On 17 May, the Secretary-General issued a statement expressing dismay at the escalation of fighting in Kabul and heavy casualties among the civilian population. He also appealed to the parties in the conflict to refrain from any further use of force in an effort to search for a political solution through non-violent means.

On 4 May and on 7, 10 and 16 June, inter-agency missions flew for one day visits to Kabul, carrying humanitarian assistance which included essential drugs. The mission developed assistance programmes with special emphasis on displaced persons. This aid facilitated the distribution of food and water and provided essential shelter materials. On 16 June, the mission organized food-for-work activities to support the clearance of areas devastated by a landslide in which more than 80 people lost their lives and up to 1,000 were rendered homeless.

On 22 June, Mr. Sotirios Mousouris, Coordinator of Humanitarian Assistance to Afghanistan, visited Kabul where he observed the distribution of assistance to displaced persons.

Delivery of Humanitarian Assistance to other areas of the country, as well as mine clearance in 13 provinces, continued during May and June. Staff members from UN agencies remained present in Herat and Mazar-i-Sharif, while missions visited Bayman, Faizabad, Jalalabad, Nimruz and other provinces.

Since December 1992, 68,874 refugees from Pakistan and 74,155 refugees from Iran have received assistance to return to Afghanistan under the Voluntary Repatriation Programme.

On 22 June the Under-Secretary-General for Humanitarian Affairs addressed an urgent letter of appeal to the international donor community in New York, attaching a Note on Current Humanitarian Needs in Afghanistan. This Note, issued on 21 January 1993, updates the Consolidated Appeal for the period of January-September 1993.

Because of reductions in the projected number of refugees returning to Afghanistan in 1993, an analogous reduction in the overall programme requirements for the Appeal period, from US $138.2 million to US $112.6 million, was possible. With only US $36.4 million pledged or received during the first half of 1993, the outstanding requirements amount now to US $76.2 million. Urgent funding is required for mine clearance, emergency agricultural inputs and health programmes. ■

Disaster Management Training Programme

Country Workshops

■ The report of the **Lebanon workshop** (19-24 April), included the following recommendations: (i) the establishment of a national committee for disaster management connected to a high office for decision-making; (ii) the establishment of a training programme in disaster management to rehabilitate public and private agencies and NGOs; (iii) the need for a national comprehensive disaster preparedness and response plan to prevent disasters and minimize their impact; (iv) the need to implement an emergency plan to rehabilitate the Lebanese people both economically and socially; and (v) promulgation and implementation of laws to prevent disasters or reduce their impact.

■ The **Philippine country workshop** and the National Forum for the Philippines took place from 17 to 21 May. The workshop proceeded through a series of exercises which used specific case studies as a means of stimulating discussions about disaster management issues among the participants. A set of recommendations was developed for each of the four categories of disaster management: preparedness; response; recovery (rehabilitation and reconstruction); and mitigation.

■ Recommendations from the **Syria workshop** (16-21 May) covered areas concerning the structure and organizational framework of the Country Disaster Management Team; elements of the National Disaster Plan; public education, information and training; resources (both financial and human); development of a disaster data bank; and physical measures (engineering, architecture).

Other Meetings

An important meeting took place in Cranfield, UK, in May when representatives of the seven Regional Collaborating Institutions (RCIs) met with the DMTP joint management in order to share the past year's experience.

Achievements and Prospects

DHA and UNDP, the joint management of the Programme, organised a meeting in Geneva on 17 June to discuss with Donors' representatives progress achieved to date. A similar event took place in New York on 21 June.

At the Geneva meeting consensus was reached that existing inter-agency mechanisms, such as IASC, should be used to strengthen agency involvement in DMTP and thereby further strengthen joint approaches. In this connection, an inter-agency consultation with representatives of DHA, UNDP, UNICEF, WFP, UNHCR, FAO and WHO took place in Geneva on 7 July.

The increase in activities and cost of the Programme in relation to its original 1991 proposal resulting from GA Resolution 46/182 requesting the *strengthening and broadening* of the Programme was acknowledged. An appeal was made by several donors for a widened bilateral donor base and for substantive and timely contributions: four countries signalled their intention to continue or to start funding DMTP. A proposal by the DMTP management to provide donors with reports every six months was agreed as desirable. ■

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ECONOMIC AND SOCIAL COUNCIL
Summer Session 1993

ECOSOC reviews the Co-ordination of Humanitarian Assistance and discusses World Conference on Natural Disaster Reduction and the consequences of the Chernobyl disaster

United Nations

AGREED CONCLUSIONS ON THE CO-ORDINATION OF HUMANITARIAN ASSISTANCE: EMERGENCY RELIEF AND CONTINUUM TO DEVELOPMENT

1) The Council welcomed the report of the Secretary-General and reaffirmed that General Assembly Resolution 46/182 is the basis for strengthening co-ordination of humanitarian assistance of the United Nations system for natural disasters and other emergencies.

2) The Council further emphasized the important leadership role of the Secretary-General, through the Emergency Relief Co-ordinator working closely with him, for co-ordinating coherent and timely humanitarian response to major and complex emergencies and natural disasters.

3) The Council emphasized that the co-ordination role of DHA must be fully supported by governments, organizations of the UN System, as well as NGOs.

4) The Council stressed that the Emergency Relief Co-ordinator should participate fully in the overall UN planning of responses to complex emergencies to serve as the humanitarian advocate in ensuring that the humanitarian dimension, particularly the principles of humanity, neutrality and impartiality of relief assistance are taken fully into account.

5) The Council called on the operational agencies of the UN system to implement, through the IASC under the leadership of the Emergency Relief Co-ordinator, the agreed division of responsibilities.

6) The Council stressed that co-ordination should be field oriented. It noted that DHA was not an implementing agency with operational responsibility and capacity in the field. At the same time, the Council emphasized the importance of the role of the Emergency Relief Co-ordinator in facilitating access to emergency areas by operational organizations, co-ordinating inter-agency needs assessment missions, preparing consolidated appeals and supporting field co-ordination.

7) The Council recognized the increasing need for humanitarian assistance and underlined the importance of adequate financial resources from existing sources and arrangements, both for relief and the continuum to development.

8) The Council requested the governing bodies of relevant organizations of the UN system to provide their full support for the implementation of the agreed conclusions of the Council.

9) The Economic and Social Council further agreed on the following:

Preparedness and Prevention

10) DHA, in co-operation with organizations of the UN system, should intensify efforts to promote preparedness, capacity-building and contingency planning for potential humanitarian emergencies. In that context DHA should accelerate the development of an effective emergency information management system. DHA should promote timely response to early warning of potential humanitarian emergencies.

11) Training is one of the most effective instruments for enhancing the preparedness and response capacity of governments and relief personnel of the UN system. Training capacities of individual UN agencies should contribute fully to meeting system-wide training requirements. The Disaster Management Training Programme (DMTP) should be further developed in full co-operation with relevant organizations of the system as an important system-wide instrument for capacity building, emergency training, and for team building at Headquarters and in the field.

Natural Disasters

12) DHA should intensify its co-operation with governments, organizations of the system and NGOs to develop a co-ordinated effort to build-up national capacities for disaster prevention, preparedness and mitigation in the context of the International Decade for Natural Disaster Reduction.

13) DHA should continue to develop the United Nations Disaster Assessment and Co-ordination Standby Team, working closely with the Resident Co-ordinator and the Disaster Management Team, to assist governments in the immediate survival phase of natural disasters.

25) Consolidated appeals should be put together at the field level with the active participation of the host government, the Resident Co-ordinator and field representatives of the organizations of the system, donors, as well as NGOs. Consolidated appeals, with appropriate plans of operation, should be a key component of a comprehensive strategy which meets immediate humanitarian needs, is compatible with longer-term rehabilitation and development requirements, and addresses root causes. Special attention should be paid to the needs of vulnerable groups including children and women. Information on the follow-up of the consolidated appeals, including the contribution and disbursement of donors and the implementation of projects contained therein, should be provided regularly to governments.

The Continuum from Relief to Rehabilitation and Development

26) Governments, development organizations of the UN system, together with the Bretton Woods institutions and regional commissions should be involved at an early stage of emergencies to ensure that needs assessments including those of NGOs, relief programmes and consolidated appeals take account of rehabilitation and long-term development requirements; promote national capacity-building; and help to prevent and mitigate future emergencies.

27) Relevant development organizations should strengthen their capacities to put into place rehabilitation particularly basic infrastructure programmes. Member states and development agencies should consider the establishment of appropriate funding mechanisms to expedite the execution of timely rehabilitation projects. Development organizations of the UN system together with the Bretton Woods institutions are invited to promote the consideration of issues relating to the relief to development continuum in appropriate development *fora* such as the UNDP Round Table and World Bank Consultative Groups.

Resources and Management

28) The Department of Humanitarian Affairs should be provided from the UN regular budget with staff as well as administrative resources that are commensurate with its responsiblities. DHA's organization and management capacities should be strengthened through recruitment, training, and staff development. DHA should also be afforded the necessary administrative flexibility to discharge its responsibilities for effective emergency preparedness and response.

ECOSOC ENDORSES 'NEW APPROACH' TO ADDRESS CONSEQUENCES OF CHERNOBYL DISASTER

The ECOSOC on 22 July endorsed proposals for future action to deal with the consequences of the 1986 Chernobyl accident, as recommended by the Co-ordinator of International Co-operation concerning that disaster.

The Council takes note of the oral report of the Under-Secretary-General for Humanitarian Affairs on strengthening of international co-operation and co-ordination of efforts to study, mitigate and minimize the consequences of the Chernobyl disaster, and of the proposals contained therein for future action on this issue, and decides to keep the matter under study.

ECOSOC DISCUSSES WORLD CONFERENCE ON NATURAL DISASTER REDUCTION

The ECOSOC takes note of the report of the Secretary-General on the International Decade for Natural Disaster Reduction, and supports the preparatory work on the World Conference on Natural Disaster Reduction conducted by the secretariat of the International Decade for Natural Disasters Reduction and the Scientific and Technical Comittee.

The Council welcomes the offer of the Government of Japan to act as host for the World Conference from 23 to 27 May 1994 at Yokohama, Japan. It recommends that the General Assembly, at its forty-eighth session give further consideration to the plans and preparations for the World Conference and to the report of the Secretary-General on the International Decade for Natural Disaster Reduction.

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